About the Issue

As you may have already guessed, the theme of this issue is the planet Earth. The cover for this issue shows one very small part of our planet, the campus Cornellians call home.

Planning a theme about Earth and environmental issues was a challenge, as producing an issue of the Cornell Countryman often is. After all, writing about environmentally related issues is not something most of us do every day. In addition, concern about the environment often resembles the old joke about the weather: everyone talks about it, but no one does anything about it. However, here at Cornell, there are a number of groups and individuals trying to do something about it. Articles on environmental literacy, the activities of the Cornell Greens, the geology of Cayuga Lake and a new, environmentally safe fungicide for roses are all in this issue.

We also hope that you will enjoy reading our articles and profiles which are not necessarily about the environment, but do focus on individuals and topics related to the College of Agriculture and Life Sciences.

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IN THE FUTURE, GARDENERS MAY be able to apply an effective, environmentally safe fungicide to their roses for a change, thanks to research done by Cornell plant pathologist R. Kenneth Horst. Research done by Horst indicates that the application of baking soda and water to roses effectively controls black spot, a common fungal disease.

Spotting and discoloration of roses due to fungal disease are common complaints of gardeners. While commercial growers are interested in the form and quality of roses, their main concern is that cut flowers should have long, strong stems, which may not be possible due to the ravages of fungi.

Prior to 1987, preliminary testing in California done by Church & Dwight, Inc., the manufacturer of Arm and Hammer baking soda, indicated baking soda had some effect in controlling vegetable diseases. Their next step was to approach Horst about studying baking soda's effectiveness against fungi in roses. Horst is the author of The Compendium of Rose Diseases, published in 1983, and of Wescott's Plant Disease Handbook, fifth edition.

Much of the research, which continues during the 1990 growing season, was done at Sonnenberg Gardens, a series of landscaped theme gardens located in Canandaigua, New York. "Sonnenberg Gardens was a natural place to test the effectiveness of baking soda on rose diseases," Horst said. "We have done surveys of the incidence of diseases among ornamentals there for a number of years," he added.

Different concentrations of sodium bicarbonate (baking soda), ammonium bicarbonate and potassium bicarbonate were tested. During the three years of testing from 1987 to 1989, a 5 percent solution of baking soda and water appeared to be the most effective in preventing black spot disease, Horst said. Potassium bicarbonate had very little efficacy in preventing black spot, and will probably not be tested again, he added. "Pascal" and "Mr. Lincoln," two rose varieties known for their susceptibility to the fungus powdery mildew, were used in the experiments.

The mixture sprayed on the roses also contained a mild detergent, to break the surface tension of the solution and allow it to spread out over the leaves. Control groups of roses sprayed with only the detergent or plain water were attacked by black spot fungi.

Strangely enough, powdery mildew never appeared on any of the roses, even those sprayed only with water. Horst attributes this mainly to the extreme dryness which occurred during the summers of 1988 and 1989. However, baking soda and water is currently being tested on greenhouse roses in which powdery mildew is a serious problem. The results are encouraging, Horst said. Horticulturists from Sonnenberg sprayed the test solutions on the roses twice a week from mid-April to October. Horst, and research specialist Stan Kawamoto, traveled to Canandaigua at least once a month and evaluated all the test and control plants for evidence of fungal damage.

They soon discovered that the baking soda and water solution washes off easily when it rains. In order to combat this, Horst is developing a "sticker" substance to be added to the mixture during the 1990 trials, which he hopes will cause the solution to remain on the plants consistently.

Exactly how the baking soda and water solution prevents the fungi from gaining a foothold is not known, Horst said. It may be due to pH changes on the surface of the leaves, or to some other kind of change in the surface material of the leaves themselves.

A variety of chemicals have been used to control insect and fungal pests on roses. Petroleum-based compounds, sulfur, copper sulfate and lime solutions are some commonly used chemical preparations. However, all possible consequences to the user and the environment, even if the chemicals are handled properly, remain unknown.

However, baking soda is a natural product, a food additive known to be safe. It is not harmful to the environment, it is effective on fungal diseases of roses and it is cheap. But, until it is approved by the Environmental Protection Agency, it cannot be recommended by Horst or anyone else as a garden spray.

When and if it is approved by the EPA, the use of baking soda and water as a fungicide will certainly be a step in the right direction with regard to environmental protection.
Food Poisoning:

by Laura M. Glazier '90

IT'S A GREAT DAY FOR A PICNIC AND you've invited all of your friends over to your house. You've made enough of your famous potato salad to feed about fifty people. You made the salad well in advance of the picnic and attractively displayed it in the largest bowl you could find. The picnic seems to be a great success and the salad gets completely eaten. But you later find out that many people at the picnic got food poisoning from your salad.

This situation illustrates the single most important cause of food-borne disease—temperature abuse. The salad was made too far in advance and in a bowl that was too large to allow the center of the salad to cool completely. The salad was also held at dangerously warm temperatures for a long period of time, so a food poisoning bacterium grew.

Food-borne disease is a problem that affects thousands of Americans each year. Unfortunate mistakes that lead to illness often remind us of the importance of food safety. Problems can occur when foods are improperly produced, processed, transported, distributed, stored or prepared.

According to Robert Gravani, associate professor in the Department of Food Science, "There are about 400-500 food-borne disease outbreaks reported annually in the U.S. These outbreaks usually involve 10,000 to 20,000 people and cause suffering, discomfort and in some cases, even death." Recent examples of outbreaks include a milk-borne outbreak that involved more than 16,000 confirmed cases of salmonellosis in northern Illinois and surrounding states, and a botulism outbreak from dried, salted whitefish that caused the death of two people.

"The numbers are hard to document though," Gravani said. The incidence of outbreaks is thought to be far greater than the figures reported. According to Gravani, "Those affected with food-borne illness may not seek medical assistance because the food source is not obvious, or the illness is misdiagnosed as another illness with similar symptoms." Gravani pointed out that people often think they have the flu, when actually they have food poisoning.

Based on estimates by the Center for Disease Control (CDC) Gravani said, "There are approximately six million cases of food-borne illness each year in the United States that result in about 9,000 deaths." An outbreak is defined as an incident in which two or more persons experience similar symptoms after eating a common food.

The press and public have generally focused on pesticide residues in food, according to Cornell food scientists. However, pathogenic microorganisms pose the most serious hazard in the American food supply. "Pathogenic microorganisms should be at the top of the list for food scientists, since they cause illness and kill many people," explained Joseph Hotchkiss, associate professor in the Department of Food Science. "No one has died of pesticide residues in food as far as I know," he continued.

There are four major causes of food-borne diseases: bacteria, chemicals, parasites and viruses. Bacteria cause the highest number of food-borne diseases. According to the latest (CDC) national statistics, in 1987 61 percent of all outbreaks, 93 percent of all cases and 80 percent of the deaths were due to bacteria.

In order for consumers to understand food-borne illness, they must first understand the difference between organisms that cause foods to spoil and those that can cause food poisoning. "Most people think that foods that are spoiled cause food-borne disease, but this is not the case," Gravani said. Food spoilage organisms can grow at lower temperatures, even in the refrigerator. These organisms can be helpful because they cause the food to smell or
What you should know

Food service establishments are often involved in outbreaks, because unsafe food preparation techniques are inadvertently practiced. Look awful and then you know to throw it out. Unfortunately, the bacteria that commonly cause food poisoning have no tell-tale signs. The food does not change in appearance or aroma and people unknowingly eat contaminated food that has been mishandled.

A wide variety of foods has been implicated in food-borne illnesses. Gravani explained that seaweeds, meats, poultry and salads can support the growth of pathogenic microbes. In addition, vegetables, dairy products, eggs and mushrooms are also considered potentially hazardous foods. Pathogenic organisms can thrive on these foods because they provide the “right conditions” for growth. Usually these foods have the proper water content, nutrients, pH and oxygen requirements that pathogenic organisms need to grow. If contained food is stored at room temperature for long periods of time, food-borne disease can result.

But in order for any food to be infected it must be improperly handled. Foods can be mishandled at any point in the food chain, but this problem frequently occurs in food service establishments and homes, according to Gravani. “People have forgotten what they learned 40 to 50 years ago about food handling and preparation,” Hotchkiss said. “It seems people are less educated about how to handle food.”

Much of the increase in the number of food-borne disease outbreaks can be contributed to mishandling of food, specifically temperature abuse. “Inadequate cooling of foods—either leaving foods at room temperature, or storing them in large containers while being refrigerated is the most frequently cited causative factor,” Gravani said.

Cross-contamination is another factor in food-borne disease and happens when cooked food comes in contact with raw food. For example, using the same knife and plate to cut and hold raw chicken and cooked chicken can lead to illness if the organisms on the cooked food have time to grow. “A lapse of 12 or more hours between preparation and eating is another contributory factor,” Gravani explained.

Changes in consumer attitudes, lifestyles, food preferences, and new processing technologies and packaging have also increased the risk of food-borne disease outbreaks. Consumers want their food to be convenient, nutritious and economical. In response to this consumer demand, the food industry has developed refrigerated foods that are partially processed. They receive heat treatment that reduces microbes in the product, but they are not fully sterile. “These foods are sensitive to temperature and consumer abuse,” Gravani said.

What can be done to prevent the increasing risk of potential food-borne diseases? “People need to understand the steps that lead to food poisoning,” Gravani said. Organisms that exist in nature get transferred to food by mishandling. Next, temperature abuse takes place where either the food was not cooked or cooled long enough. Finally, if the organism is given time to grow and someone eats the food, an illness can occur. “It’s important to note that not all people who eat contaminat-ed food will become ill. People who are old, young, ill or pregnant are more susceptible to food poisoning,” Hotchkiss said.

In order to combat the epidemic of food-borne illness, Gravani and Hotchkiss both stressed the need to educate the public. “Cornell Cooperative Extension, through the county offices, does an excellent job of providing the media as well as consumers with facts about what can be done to prevent food-borne illness,” Gravani said.

In addition to providing facts to consumers, Gravani gives research-based information to the manufacturers, the food service industry and New York state food inspectors. An approach called the Hazard Analysis Critical Control Point (HACCP) process, estimates the microbiological risks associated with processing, marketing or preparing a food product. The system is a tool that can be used to identify hazards at each stage of food manufacturing and provides control points and monitoring steps.

The importance of food safety is demonstrated by the outstanding number of food-borne illnesses and deaths each year. Combating the problem can be accomplished by working with food manufacturers as well as consumers. So, the next time you are planning a picnic, think about the proper handling of food. It could prevent a great day from turning into an outbreak of food poisoning.

Foods are often mishandled in family households which can cause food-borne illnesses. The major factor involved in outbreaks is inadequate cooling.
Fooled by Fake Fats

"I SCREAM, YOU SCREAM, WE ALL SCREAM for ice cream." Sound familiar? Children gleefully anticipate the moment when the ice cream man drives his truck through the neighborhood. The distinctive bell can be heard by every child in the entire community.

Ice cream has historically been a delectable treat for people of all ages. In 19th century America ice cream was so rich in butterfat, it was considered too sinful to eat on Sunday. The term 'sundaes' developed as a code word for those people who insisted on sampling this heavenly sin but wanted to avoid the embarrassment of having to ask for it by name, according to The New York Times.

In the more recent past, there has been growing concern over the long-term health effects of high-calorie and high-fat foods. The past five years have been marked by a flood of reduced-calorie and reduced-fat products. According to Christina Stark, a nutritionist for the Cornell Cooperative Extension specializing in nutrition education, two new fat substitutes, Simplesse and Olestra, have been introduced to the public. "The Food and Drug Administration approved Simplesse for use in frozen desserts on February 22, 1990, but Olestra has not yet been approved," according to Stark.

"Simplesse," said Stark, "is made by manipulating egg or milk protein," so that it has the smoothness, richness, and creaminess of fat. "Protein particles are heated and blended by a patented process called microparticulation that changes them into tiny beads resembling fat particles. The tongue perceives these particles as fluid, creating the sensation that fat is being consumed," said Stark.

"Simplesse is limited by the fact that it's made of protein," Stark explained, "It can't be used in any product that's heated or cooked." That is because the proteins would coagulate causing the fat-like smoothness to disappear. Therefore, Stark confirmed, Simplesse is limited to use in products such as frozen desserts, dairy products, mayonnaise-type salad dressings, and margarine-type spreads. Simple Pleasures, a new frozen dairy dessert, is the first product on the market made with Simplesse.

"Olestra," according to Stark, "is a completely different chemical and it does withstand heat." She explained that Olestra, chemically called a sucrose polyester, is made by combining sugar with fatty acids.

"Despite the sugar component, the product is not sweet, but instead looks, tastes and behaves like ordinary fat. Due to its unique chemical structure, digestive enzymes cannot break it down and, therefore, it is not absorbed. The result is a calorie-free substitute for fat." On the other hand, Stark explained that people do digest Simplesse like any other protein and although it is less caloric than pure protein, it is not calorie-free.

"One underlying assumption about reduced-calorie and low-calorie products," Stark explained, "is that they will help people lose or at least maintain weight." Stark foresees a lot of products made with Simplesse but believes that it will not be a big breakthrough. "Currently on the market we have a number of reduced-calorie products. There is reduced-caloric mayonnaise on the market, and you can already buy diet margarine," Stark said. "The existence of these products hasn't made a dent in our weight problem in this country," according to Stark. "My guess is that they [products made with Simplesse and Olestra] will be just more of those similar kinds of products that might be helpful for some individuals trying to lose or maintain their weight but they're not going to cure our overall obesity problem," said Stark.

"Most food additives are a very small percent of food, but these two could comprise a major portion of a product," Stark said. "They may make up 30 to 40 percent of a food rather than a more usual level of one to two percent for other food additives." Because of this, the Food and Drug Administration has acknowledged its lack of experience to predict the impact of such substitutes, Stark explained. One major concern, according to Stark, regards the dietary impact of consuming large amounts of fat substitute. "If people eat a lot of fat substitute, what is that going to do to their protein intake? Their carbohydrate intake? You could shift the whole percentage of calories in the diet," Stark said.

"Fat substitutes should not be perceived as a cure for bad eating habits," said Stark. She recommends improving a high-fat diet by modifying recipes and cooking methods, and by including more whole grains, low-fat dairy products, and fruits and vegetables, rather than by merely replacing the fat with lower-calorie substitutes. ■

by Cindy Rosen '91
What would it be like to live on an ocean floor? It should be sandy, moist, and full of plant and animal life, right? Wrong; it would only be that way if it were a modern ocean with water and fish. If it were the floor of an ancient ocean, the land would be flat like shale and be full of small fossilized sea animals, which is exactly the type of land Ithaca is located on.

How was the Cayuga Lake basin formed if the area was originally a flat ocean floor? Where do you look to find the fossils of ancient sea animals? Why is Ithaca located where it is? Ever since 1983, students of the Cornell Adult University's summer session have been able to discover the answers to these questions in a unique course.

The course, which is offered for one week in July or August, was created by John Chiment, a paleobiologist, who moved to the Ithaca area in the early 1980s. Having done graduate work on dinosaur bones in Montana, "I was interested in the rocks here, but these rocks were much older than the rocks that I was familiar with. These rocks are all significantly before the time of the dinosaurs," Chiment said.

Much of his early research for the course was conducted by simply driving around the area. "When my wife, kids, and I would drive into the country looking for old farmhouses, I'd say, 'I wonder why that's over there or what's this doing here?'" Chiment said.

By buying many of the history books published in small area towns for the bicentennial in 1976, Chiment was soon able to get some idea about the history of the area. "Then I found some old mimeographs that had been put together at different times in the past when Cornell University hosted the New York State Geological Society's yearly meeting," Chiment said. "When you host this meeting tradition says you should prepare a field guide which tells the geologists where they can go and what they can find.

"Well, I went to the library and found a couple of these field guides and just followed those suggested trips," Chiment said. By combining the geological notes in the mimeographs and the historical events of the history books, Chiment created an interesting and informative class.

"I offered the course for a couple of summers using buses. We would go to Willard, N.Y. and look at a cemetery. We would go to a winery and talk about the soil and why grapes grew well here and the climate that was caused by the lakes," Chiment said. "But, after a while people were saying, 'Gee, this is fun and I like getting out, but we are spending a lot of time just seated on a bus.' So, I said, 'Well, let's do the whole thing on bicycles.'"

"The real advantage of bicycles is that I can tell you there is a slope of 50 feet to the mile and you say, 'yeah, o.k.,' but if you have to go up that slope on a bicycle you really appreciate what I'm talking about. Also, while there is a very gentle slope if you are going from the south to the north," Chiment said, "there are places where there is a break in that slope, which causes notches where you will find Salmon Creek or Taughannock Creek. So if you are coming from the north going south, you get to go down that gentle slope until you get to one of these notches and then you have to go up a pretty steep slope.

"What I am trying to do in the class is pull together sort of the notion of human ecology of the area. Because, if you understand the geology of the underlying rock structure, you can figure out why things are the way they are," Chiment said. "Why Indian villages and modern settlements are always located in the same kind of spots and what is important about that spot."

"Usually, what you find is that it is a place where something happens geologically. There is a stream bed that goes through there because there is a crack in some of the strata and this allows the creek to work its way down to lake level," Chiment said. "Towns tend to be built in geological areas, because the stream provides fresh water for drinking, as well as a means of getting to the lake. "So generally, if you find a place where you stop and pause and say, 'This is where I would like to build my house,' and you look down at your feet there is a good chance you will find arrowheads, because that's a place that some else thought was a good place to build a house too," Chiment said.

The people who take the class are a mixed bunch, ranging from teenagers to people in their sixties, and from single professionals to husband and wife teams. Yet, everyone learns about the geology of the area through hands-on experience. In a week, the class literally covers a lot of area.

Starting on Monday morning, the class gets a bike safety lecture from Lois Chaplin, who works for Cornell Cooperative Extension. Then they check out their bikes and take a five mile ride around campus. The class then heads up to Portland Point, an important fossil location which is 10-12 miles north of Ithaca. There they collect fossils in the afternoon before returning to Cornell.

"It's a very steep hill coming out of Portland Point so part of that is to see that they know how to use their gears and they know how to negotiate steep hills," Chiment said. "My wife is right there with a car for anyone who really can't make it. But, if they can live through Monday, they know they will be able to get through the week."

"Tuesday, Wednesday, and Thursday, we go out to different fossil localities, geologic areas, and Indian sites. One day we go over to Trumansburg and visit Taughannock Falls and an old Iroquois village," Chiment said.

Friday is like the final exam. "We start off in Ithaca and we ride up to the north end of the lake going around the western edge. We stop at a couple of places and I tell them a little bit about the geology and the history of the lake," Chiment said. "We get up to the north end, which is the Montezuma Wildlife Preserve, we go into it and look around. Then we get on our bikes and ride down the east side of the lake. We come through Union Springs, Aurora, Lansing, and end up in Ithaca. We do about 45 miles on the bike that day."

People enjoy the class so much, that Chiment had two classes during the summer of 1990, one on bikes for the hardy and one by bus for those less physically inclined. So if you want to know why Ithaca sits on an ancient ocean floor, or what the waves of human immigration were in the Ithaca area, think about taking Chiment's class through the Cornell Adult University. If nothing else, the bike class will teach you to appreciate how hard geology can make biking.
Saving the Earth

by Natalie Schwartz '91

As environmental crises such as waste buildup and energy depletion plague the nation, many Americans continue to toss stacks of plastic bags in the garbage and forget to turn off the lights. Through educational campaigns, the Cornell Greens encourages members of the campus community to help save the earth.

"We see education as a means of changing behavior," said Cris Moore grad, one of the group's organizers. The Greens, founded two years ago, has organized many campaigns to raise campus awareness of environmental issues and modify behavior. The Cornell Greens' members can join whatever project interests them or initiate one of their own. The Greens consists of 50 active members and has a mailing list of 250 members.

In the spring of 1990, the Greens launched about 20 educational projects, according to Earth Year '90 News (April). For instance, about 20 members designed and delivered a presentation on recycling to students living in University dormitories. They told students how to use the recycling program at Cornell and how to reduce waste production. "The people in the dorms that we talked to were very receptive," said Scott Peppet '91, one of the project's organizers.

The recycling group told students to separate recyclable items such as notebook paper, newspapers, computer printouts and envelopes from their trash and place them in specially marked containers. They also told the students what items were not recyclable such as glossy paper and food. "The hope was that the knowledge would percolate through the dorms," Peppet said.

Greens members have also organized a campaign to educate the campus community about the destruction of old growth forests. "Ninety-five percent of the natural uncut forests in this country are gone," said Jeffrey Ross '90, one of the project's organizers. "What remains is on national forest land in the Pacific northwest and is being cut down at a rate of two square miles every week. Within ten to 30 years, there will be no viable old growth ecosystems left." Thousands of species depend on these forests to survive, he said. "There will still be trees in Wilderness Protection Areas, but not enough to support a viable ecosystem.

"What we're doing is trying to educate people and make them aware of the issue," Ross said. "These irreplaceable forests belong to all of us. We have the right to decide their fate. I am convinced that 99 percent of Americans would oppose the government's systematic attempt to eliminate our native forests if they only knew the facts," he added.

The native forest protection group of the Greens organized a workshop at the Eco-Justice Conference in the spring of 1990 and has brought speakers to the Cornell campus. The group has also encouraged people to express concern for native forests in letters to...
Earth

their legislators, Ross said. They should urge members of Congress to support The Native Forest Protection Act of 1990, which seeks to maintain public native forests, he added. The group has set up information and letter writing tables during lectures given at the Ecology House.

In addition to initiating a letter writing campaign, the native forest protection group has circulated petitions at rallies and meetings. One petition asks Congress to support The Native Forest Protection Act and the other protests destruction of old growth forests.

While some Greens members educate the Cornell community about recycling and the plight of old growth forests, others have organized a campus-wide energy conservation campaign. During Earth Day weekend in April of 1990, the group encouraged Cornell students, faculty and staff to reduce energy use by turning off lights, taking shorter showers and turning heat down. The campus facilities division monitored energy use over the weekend to determine whether energy consumption dropped. The Department of Facilities Engineering did not measure any change, however, according to Stephen Little, of the facilities engineering department. He said they plan on measuring energy use again in the future.

In order to promote energy conservation, the Greens, the facilities division and the Department of Residence life plan to distribute orientation materials in the fall of 1990. "As a resident in Cornell dorms, I see a lot of waste all around me. Alliances between students and the administration have been difficult in the past, but I am glad that we can work together on this issue. By working together, we can make energy conservation a permanent habit of Cornell students and faculty," said Alison Offerman '93, one of the campaign's organizers.

While raising awareness of environmental issues on a local level, the Greens have shared their project ideas and activities with other student environmental groups in New York state. The Greens organized New York state membership of the Student Environmental Action Coalition (SEAC), a national network of student groups.

Groups from over 1000 campuses nationwide exchange ideas through state and national newsletters. SEAC also sponsors national campaigns.

In another national effort, the Greens participated in the national celebration of Earth Day, April 22, 1990. The Greens, along with other environmental action groups, distributed educational materials to students, faculty and Ithacans who attended the celebration. They held a rally two days before the event at Willard Straight Hall to celebrate achievements in environmental reform, discuss the issues and promote Greens' campaigns. At the rally, they kicked off the energy conservation project and collected signatures for a petition supporting an environmental literacy campaign. The petition asks administrators to make it easier for arts students to take natural resources courses.

On Earth Day, the Greens set up tables displaying literature on recycling, environmental literacy, energy conservation and the old growth forest issue. They asked people to sign petitions supporting the protection of old growth forests and environmental literacy. They also sold a pamphlet that suggested ways Cornell students can help save the environment. "We found that a lot of people are interested in the environment, but they're not sure what to do," said Robert Weiner '91, the pamphlet's author.

Through the Greens' efforts to educate Cornell students, faculty and staff, the University can help preserve the earth instead of contributing to its destruction.
Sounding Off

AS YOU WALK INTO THE COLLECTION room in the Library of Natural Sounds at the Cornell Laboratory of Ornithology, all you see are rows upon rows of tapes—thousands of them, organized taxonomically. Each tape contains the recorded sounds of a single species of animal. Look behind you and you'll see another set of shelves full of tapes—master tapes for the Library of Natural Sounds audio productions: 10-inch or 12-inch full-track giant reels, packed with all the sounds of nature.

The person in charge of all of these yards of tape, Greg Budney, proudly claims that Cornell's Library of Natural Sounds (LNS) is the largest collection of its kind in the world. Scientists and hobbyists from all over the globe collect these sounds in the course of their research, or for pleasure, and send their tapes to the LNS for copying and safekeeping. "We became sort of the central hub," said Budney. "We really rely on the contributions of the people..." he continued, "and in return, we make sure their tapes are well cared for and available to others around the world."

Not all of the recordings are collected by "outsiders," however. The diversity of people using the tapes is almost as great as that of those collecting them. For example, when Lucas Film Company wanted a specific bird-call background for the movie Raiders of the Lost Ark, they came to the LNS. Other media oriented customers include the British and Canadian Broadcasting Corporations, who frequently use LNS tapes as feature and background sound for their programs.

In addition to providing background sound for film and television, the collection is used to aid more scientific pursuits. "It's a great resource for people who are working on tropical conservation," because in the rainforest, it is much easier to hear animals than to see them, Budney said. In some cases, researchers obtain recordings of the sounds of animals they are looking for from LNS and memorize them before going out into the field. "Just about every animal has a unique sound," Budney said, "That's what this library is—a collection of unique sounds."

According to Andrea Priori, User Services Technician at LNS, other common customers are museums and zoos. "In a lot of zoos now, the animals are behind glass, but they [the zookeepers] want to re-create a natural environment for the public," she said.

Priori, who handles all user requests for sounds, said that the LNS provided nearly 3,000 recordings to collection users in 1989. At the current rate, she added, even more than that will be done in 1990.

The LNS also handles several productions for commercial sale, some their own, some in cooperation with others. For example, LNS produced the tapes that accompany the National Geographic and Peterson's field guides, "Some big-name productions as far as birds go," according to Budney. The library was also responsible for a commercial tape called "Songs of the Warblers of North America." In addition, LNS recently produced "A Birdsong Tutor," a tape on birding for the blind, (see page 3, Cornell Countryman, March 1990) sponsored by the National Library Service for the Blind and Physically Handicapped of the U.S. Library of Congress and the Canadian National Institute for the Blind.

The LNS's production and field equipment is quite impressive. For their commercial productions the library has racks full of top-of-the-line cassette decks for duplication. Each of these has been fine-tuned by the library's engineer to be sensitive to a range from 20 to 20,000 hertz—far beyond the capabilities of most such decks. In order to ensure the highest fidelity, all duplication is done in real time.

For field recording, the LNS owns 10 Nagra open-reel tape recorders—the kind used in television and film production. These recorders are used frequently by people affiliated with Cornell. Each machine is built to last, and costs roughly $10,000. Some of LNS's machines are 25 years old. Budney said, "There are tales of Nagras having been dropped out of helicopters which come up running." LNS's work perfectly thanks to the work of the LNS's full-time engineer.

In addition, the LNS has a mastering studio, where field tapes are not merely transferred to the library's masters, but engineered for the best possible sound. Budney claims that the studio is one of the finest of its kind in the eastern United States.

The library is currently working on a number of projects to improve service to their community. For example, they have recently begun making safety copies of the master tapes. These back-ups will eventually be moved to a secure storage facility in Pennsylvania, thus assuring that the collection won't be lost by disaster, such as fire. Another project in progress is the computer cataloging of the collection—nearly 70,000 recordings, of which 20,000 have been cataloged already. The LNS is also currently installing a visitor's sound studio and analysis system, similar to the current mastering room, where knowledgeable visitors could do their own work without tying up one of the work studios, in constant use by LNS technicians. The money for all of these projects, and others, comes partially from Cornell, but mostly from the National Science Foundation and private donations.

Whether you need to research a certain animal, need background sounds for a film or tape, or just want to learn more about animal sounds, the Library of Natural Sounds is the perfect resource.

by Michael S. Shappe '91
KIDS HATE SCHOOL. IT'S A FACT OF life. Kids hate homework. Another fact of life. Other than the fact that it's a necessary evil, not a lot can be said for anything to do with school—at least not from a kid's point of view. Why, then, would any seven- or eight-year-old kid in his right mind subject himself to two or three hours of semiformal instruction at the local Salvation Army after school lets out for the day?

Many reasons exist. Some children need additional tutoring just to keep up with the workload. Other kids go to The Salvation Army to either get ahead or stay ahead of the game. And others are there because their parents don't want them to fall further behind in their work. In all, there are about 30 or so children from the Ithaca area who utilize The Salvation Army's One-to-One program. To go along with that, there are a handful of tutors from Cornell's Department of Education as well as tutors from the local community who come in to help out.

The set-up of the One-to-One tutoring program is interesting. Each day after school, about 10 to 15 kids show up at the downtown Ithaca Salvation Army complex, and become a part of a semi-recreational, semi-serious atmosphere. In the complex's gym, the youths are allowed to play board games, basketball, tag, or whatever they can think of, while under the loose supervision of one or two Salvation Army regulars and Ithaca College students serving brief community service penalties. At some point between the time they get there and the time they leave, many children will receive an hour or so of tutoring from one of the available tutors.

"It's kind of a cross between a daycare center and a private tutoring school," said program director Bob Abele. "We try to make it as relaxed as possible for the kids who need help, and most of the kids genuinely need all the help they can get. Some kids, though, are just behind in their work because they've been slow-tracked by the school system since the first day of kindergarten. I really don't like it when I see that . . . A lot of the kids have failed at least one grade."

The common bond between the children at The Salvation Army, unfortunately, is that almost all come from low-income backgrounds. Most are there simply because their parents cannot afford to send them to a private tutor. "None of them are rich," Abele said. "Many come from adverse situations. Rashad was a victim of abuse . . . Evan's teacher described him as not having enough math aptitude to count his bail money."

At first it's almost always just the parents who want their children in the program. After a while, though, as the kids begin to get used to the program and the tutors, they become more enthusiastic—or at least less resistant—to coming to the after-school program.

Cornell students play a key role in keeping the program rolling. Students in two courses in Cornell's Department of Education are given the chance to work at The Salvation Army for two or three hours a week to complete their field experience requirements. The courses—The Art of Teaching, and Youth Organizations—both focus specifically on pre-adolescent children, and The Salvation Army offers them a perfect atmosphere to begin careers.

"Working with the kids is great," Cornell senior Tammy Kahn '90 said. "They look up to you, and you really feel like you're doing something for them. Usually, they have some general idea how to complete the assignment. They just need someone to help them out a little."

Kahn gave one example. Shannon, a fourth-grader, is someone who needed just a little help during a recent tutoring session. While doing one math problem set, she was able to complete the problems when she set her mind to it. But when she lost her concentration, she said she needed help because she didn't know how to do the problems.

Other children are not so fortunate. Billy Joe should be in the third grade but because she was placed in remedial classes in kindergarten, she is now only beginning second grade. She needs the help so she doesn't fall even further behind.

Overall, Abele said the children probably don't love the program, but they don't hate it either. During the time they are there, everyone is given the opportunity to play with kids their own age (something they might not get at home). Most of them realize that they need to be at The Salvation Army to keep up in school.
REMEmBER EARTH DAY 1990? YOU saw advertisements, lectures and celebrity sponsorships, but what was the message? What did you get out of Earth Day?

On April 22, 1990 millions of people gathered to celebrate the Earth, our home. Why not? We celebrate Mother’s Day and Father’s Day, but we continue appreciating these people for the rest of the year. Think of Mother Earth. She needs appreciation on a year-round basis, too, not just on Earth Day.

“The main goal of Earth Day was to get people initiated into environmental awareness,” said Joellen Kozlowski ’90, a Resident Advisor to Cornell’s Ecology House, which organized Earth Day on campus. She described environmental awareness as a ladder with people standing on different levels. “We want people to go up a couple of steps in terms of their knowledge,” she said. “It’s important that [the learning] doesn’t end.”

You want to do the right thing and help the environment. You try to remember to select paper bags instead of plastic bags; you recycle cans and bottles (most of the time), you buy products made from recycled materials (usually by coincidence). These small efforts make you feel good because you think you are doing your part for the environment, but you lack respect.

According to Dr. Charles Smith, adjunct associate professor in the Department of Natural Resources, and research ecologist at Cornell’s Laboratory of Ornithology, “People must be aware that all of the publicity associated with Earth Day refers to ‘the environment’. As long as we perceive it in that impersonal manner, we won’t make progress. It’s OUR environment . . . yours and mine.” So, it is time to listen to our environment. Tune in, and learn.

Misleading information poses a big problem in terms of educating the public about caring for our environment. “It drives me crazy when I see posters in a grocery store telling people that plastic bags are better than paper bags,” Kozlowski said. People want to do the right thing, but they also want to do the most convenient thing. Plastic bags have handles, they keep frozen food from dripping on everything, they make great bin liners and they use less storage space. In fact, there are 101 uses for a plastic bag in the home, but when that bag has passed its prime, it is thrown away.

“It’s biodegradable,” you say. “It’s not,” I say. A biodegradable plastic bag appears to disintegrate, but it actually breaks up into microscopic pieces, making you think the bag has biodegraded. If you really want to do the right thing, become environmentally educated to avoid misinformation.

“It should start at kindergarten,” said Smith. “Ecological literacy should be taught along with reading, writing and arithmetic.” In an attempt to integrate environmental education into the elementary school curriculum, the Cornell Plantations has published an activity book (printed on recycled paper) called “The Tree and Me” in conjunction with the Earth Day activity by the same name. “We want to make the book available to educators and parents,” said Margaret Corbit ’71, Public Relations Manager for the Cornell Plantations. “The actual activities are geared toward preschool and up, but require parental participation. We hope that parents will learn along with their children.”

The book begins by explaining what a tree is, and how trees get nutrients from the sun and earth. As the pages turn we learn that trees replenish our water and air supply, and provide us with energy. The book emphasizes the fact that trees make people happy, and we exploit them as resources for wood and paper products. It subtly exposes children to pressing environmental issues.

The College of Agriculture and Life
Sciences at Cornell is now investigating ways of encouraging older students and the general public to learn about our environment. Part of the problem may be that people ignore the opportunities. "You would be surprised to find out how much Cornell is doing environmentally," said Corbit. "We are at the leading edge of environmental ethics and technology."

Corbit is a member of the Earthyear '90 advisory committee, a Cornell group that promotes environmental awareness through events and activities. The Earthyear '90 newsletter informs the public about the different campus groups like the Cornell Greens and Ecology House, lectures and current environmental issues. "Earthyear is bringing faculty members and researchers in contact with each other and alerting the Cornell community as to what is going on," she said.

"We want to increase consciousness," said David L. Call '54, Dean of the College of Agriculture and Life Sciences. "Historically, the College has focused on agriculture. Now, the focus is shifting toward environmental issues because they are real issues." Call explained that studying environmental topics is no longer restricted to environmental engineering and natural resource majors. Instead, students in majors ranging from communication to rural sociology discuss topics like acid rain, waste management, sustainable agricultural development and the effects of chemicals on the environment.

"We want to give visibility to environmental studies," said Call. "And, we want to develop a coherent program more understood by everyone." He believes Cornell can do better in terms of available introductory courses that focus on our environment, especially with the growing environmental interest he has seen among the faculty, both in the College and throughout the University.

Cornell also offers a variety of ways for people outside the University to learn about our environment. Cooperative Extension programs translate research results into practical knowledge for people across New York state and 4-H youth development programs often deal with environmental issues. The public is encouraged to wander through both the Plantations and Sapsucker Woods, which gives them the opportunity to practice identifying species of plants and animals at their leisure. And, the Earthyear committee promotes environmental lectures, art shows and special events like Earth Day.

However, the people who take advantage of these activities have already been "initiated." "You can't force someone to care about environmental issues," said Kozlowski, who plans to go into environmental education. "I only hope that things will get ingrained so people won't forget."

Smith said that he thinks there is a positive trend toward environmental awareness partially because the consciousness coincides with large-scale global problems like the greenhouse effect and the depletion of natural resources. "The popular press suggests environmental issues are important," he said. "But, we still don't produce a really good commercial television show in the U.S. about our environment." The Laboratory of Ornithology promotes interest in birds through its quarterly magazine The Living Bird and its radio spot called "Birdwatch."

Where this trend will lead, nobody knows; we can only speculate. "One thing Earth Day did was it gave concrete career options that deal with environmental concerns," Kozlowski said. Of course, concrete solutions to environmental problems are not as evident to some people. Those people are not getting the message.

by Karen de Seve '90
Dance to Success

UNLIKE MANY FOUR-YEAR-OLDS, Jennifer Tomsen ’92 never dreamed of becoming a ballerina. She certainly never thought she would one day be a professional dancer. Yet fifteen years later, that’s exactly what she was.

“I was always coming home and telling my mother how much I hated dancing,” said Tomsen, “but I would never quit! I guess I must have liked it more than I thought I did.” In fact, Tomsen liked dancing enough to dance professionally for five years with the Dayton Ballet Company in Dayton, Ohio, before coming to Cornell as an undergraduate.

Tomsen began dancing when she was four years old. She trained in ballet, jazz, and modern dance. At age eight Tomsen entered the Dayton Ballet Dance Center, and by the seventh grade she had been chosen to dance with the Dayton Ballet’s second company, just one step below professional status.

“At that point I knew I wanted to stay with it until I graduated from high school but I didn’t want to be a professional,” said Tomsen. When her senior year arrived however, a latent dream began to emerge. “I had applied to six different colleges. We visited them and all I could think about was whether I would get a contract [with the Dayton Ballet’s professional first company] or not.” When the offer came, Tomsen accepted immediately. “I had always wanted to go to college, but I knew I had to dance now or never, so I decided to put college off for a while,” she said.

A professional dancer’s life isn’t exactly easy. A typical day consists of a warm-up, two hours of class in the morning and then five hours of rehearsal in the afternoon. “It was always tiring but some days it was really deadly,” Tomsen said. She went from high school straight to the “real world.”

Tomsen lived on her own and made enough money to support herself dancing. “I had a lot of responsibility. I was forced to grow up,” she said.

Tomsen performed with the Dayton Ballet throughout the August-to-April season. In addition to touring the central and eastern United States, she also had the wonderful opportunity to perform with the company in the Middle Eastern country of Jordan.

The pressure to succeed was intense. “You go in every day, and every day you have to impress,” said Tomsen. “The pressure could be overwhelming.” In the world of professional ballet, Tomsen explained, the director has the freedom to say almost anything. “You might feel like you did a good job, only to have a director come backstage and say, ‘That was embarrassing. You were terrible. What were you doing? You’re setting yourself up,’ said Tomsen. “It’s mental agony, but if you’re strong, you can make it through the bad times.”

Tomsen felt a great sense of accomplishment dancing with the company. “The experience of performing is something you’ve worked your whole life for. It takes so long to get there. When you finally do, it’s a great feeling.”

Yet all the while, Tomsen was still harboring plans to eventually attend college. At night she took classes, first at the University of Dayton and later at a nearby community college. Tomsen was the only dancer in her company who planned to go back to school full time.

“The first one or two years with the company I really liked it. It was satisfying,” said Tomsen. “But I was always looking ahead and wanting more.” It was around that time that she began to have problems with her knees. When surgery did not help, Tomsen was not only in pain, but frustrated as well.

Meanwhile, Tomsen heard about Cornell and decided to look into it. She applied as a communication major and was accepted. For the next three years Tomsen deferred her acceptance, to continue dancing, until one day she suddenly decided it was time to quit ballet. Fed up with the anxieties of the business and her knee injuries, Tomsen contacted Cornell. “Little things come to mean so much,” she said of dancing. “If you’re moving up you can take the pressure, but you can get caught in a trench and never climb out. That is the point that I got to. I was so tired of the pressure.”

Even so, quitting was more difficult than she had thought it would be. “Even though I had other interests, it’s not easy to quit because dancing is how you define yourself. It becomes a part of your personality.” In a way, Tomsen said, she lost a part of what she was.

Yet, Tomsen has never regretted her decision. She transferred to the ag college in the fall of 1989. Since then she has become a biology major and plans to pursue a career in scientific writing.

Tomsen is enthusiastic about being a student again. “I think I like it so much here because it’s not related to what I was doing. I had plenty of years of being artistic,” said Tomsen.

At the same time, she misses the constant performing. “Ballet is rewarding because it’s so intense. You miss that when you’re done.” Tomsen does perform each semester as a member of the Cornell Impact Dance Troupe. In the group, her past is respected but it doesn’t make her any different than the others. “I do what the choreographers tell me to do,” said Tomsen, “Everybody is equal.”

As a dancer turned student, Tomsen has already managed to fulfill two dreams in her lifetime. “I think everything has worked out perfectly,” she smiled. “Most people [at Cornell] are inquisitive about my past because they don’t know much about dancing,” she added. While Tomsen doesn’t mind having to explain her past, she’s quite happy to be a student again. “Dancing was an incredible experience, but I wouldn’t want to be anywhere else right now.” ■

by Kate Snow ’91
WILLIAM PROVINE IS, IN HIS OWN words, not an ambitious person. Although he teaches Evolution and History of Biology as a Professor of Ecology and Systematics/History, is praised by students as being energetic and devoted to his classes and writes and edits many books on evolution, Provine said he doesn’t put the time into advancing his career. He added that most of his time, effort, and energy goes into his family and home.

The way he works with students, though, it certainly does not seem like that is the case. Provine, who has been at Cornell since 1969, is one of the more prominent professors on campus. Some students love his ways of teaching, while others are offended by his strong views on evolution. But Provine does not mind the controversy at all. He hopes to stir people into thinking about their beliefs.

After receiving an undergraduate degree in mathematics from the University of Chicago in 1962, Provine started teaching at a private day school in Illinois. "I enjoyed it immensely," he said of his experience. What amazed him about the students was that they had the same insights that great scientists have had. So he decided to learn the history of science to understand the students better, fully anticipating that he would eventually become a high school teacher.

As a graduate student at the University of Chicago, he first studied Greek science. But, he said, "I didn't like the Greek teacher," and the feeling was mutual. Provine switched to modern science, working mostly in zoology. During this time, he said, "I compared the life of a professor and the life of a high school teacher." Eventually, he decided the hectic life of high school wasn't for him and he would rather be a professor.

Prowine's views on evolution also began to change as a graduate student. His Protestant family was semi-religious, and Provine usually went to church in high school and as an undergraduate in college. His father, who studied under Alfred North Whitehead, a professor at Harvard who believed evolution was a purposive process, greatly influenced Provine. But while studying evolutionary biology, Provine looked at the evidence of the evolutionists and came to disagree with Whitehead and his father.

Unfortunately, Provine never had a chance to talk to his parents about his new beliefs. In 1966, both of his parents were killed in an auto accident. The accident was a serious blow to the tightknit family of five children. "There's lots of things I'd love to talk to them about that I never did," he said. "I anticipated great conversations with them—a lot of debates."

After graduate school, Provine taught for one year at a now defunct college in Detroit. He came to Cornell because he was given a persuasive offer and "It was an exciting place to be," he said. This arrangement succeeded because his wife received her law degree and her PhD in political science from Cornell.

About his job, Provine said, "My primary motivation in teaching is to get students thinking seriously about the issues." He does offend some students, but, he said, "My views are not normal views so they will make them [the students] think about their own." In his Evolution class, he does take other viewpoints, including the Creationist view. If he can stimulate students into thinking, he added, then he is a good teacher.

However, Provine puts his wife and children before teaching. "I'm dedicated to my family and home," he said.

"No picture of Will Provine is accurate without saying that he is completely devoted to his family and his life out on the farm," said Sergio Sismondo PhD '93, one of Provine's teaching assistants. But Provine is also committed to his students. Sismondo said, "He's dynamic and energetic in every way." Sismondo added, "The energy he puts into his class time and the presentation of the class and the material makes him different from other teachers."

Provine is presently doing research on the neutral mutation theory of molecular evolution of the Japanese evolutionist Motoo Kimura. According to Sismondo, the neutral theory dictates that at the molecular level, evolution is essentially random. Provine is also eventually moving his evolution collection of books and reprints, some of it dating back to the early 1900s, into Corson Hall so his graduate students and he will have easier access to it. He said the collection is probably the largest single, private collection anywhere.

At home on the farm, Provine and his wife are animal rehabilitators for New York state, so there is a "flow of animals in and out of their house all summer." He also collects antique farm equipment, which now includes a 1935 John Deere B tractor and a 1950 Caterpillar D-4 crawler tractor.

As for the future, Provine said, "There are lots of possible projects and it's quite likely I'll stay in academia." One could also bet he'll stay on the farm with his family.

by Andrea J. Lillo '90
Environmental Literacy

YOU CANNOT HAVE PICKED UP A newspaper in the past year without reading the latest information on the ozone layer, acid rain and rapidly diminishing landfill space. On the Cornell campus, students have witnessed the efforts of environmentalist groups to inform and educate the public in celebration of Earth Year 1990. The Environmental Literacy Campaign is one such effort.

The broad goal of the campaign is for "every Cornell graduate to have a working knowledge of environmental issues," according to Kris Moore grad. He and Andrea Sultana '93 spearheaded the effort to voice student concerns to the administration as it attempts to restructure the environmental sciences offered at Cornell.

"It's not that we don't have enough courses," said Simon Levin, director of the Center for Environmental Research. "It's simply a matter of coordinating the courses already offered." He and David Call '54, Dean of the College of Agriculture and Life Sciences, head a committee that is investigating ways to increase options available to students who want to know more about the environment, including creating a new major and changing what classes fulfill distribution requirements. Distribution requirements are courses in a breadth of fields required by the ag college.

Environmental courses range from natural resources to agricultural engineering. "Environmental sciences is not just a matter of collecting and monitoring data," Sultana said. "You need to know how to use that data in building factories, manufacturing goods and lobbying legislatures." Ideally, an environmental sciences major would take courses in government and communication as well as the sciences, Moore said, so that they could use their technical knowledge.

by Kris Gillispie '90

Moore called the environment unique as an issue because individual awareness is so important. "The more people know about the problems facing our environment and what they can do about it, the more likely they are to stop using plastic bags or throwing out paper," he said. National attention to the environment has already raised awareness, yet when Cornell students look for more in-depth information from their classes, they often run into a brick wall.

The natural resources major is currently the closest thing to an environmental sciences program that Cornell offers because of its emphasis on biology and ecology. Yet the introductory course in environmental conservation does not draw the enrollment it could because it will not fulfill distribution requirements.

Sultana does not believe students lack interest in the conservation course. Nearly 200 students registered for the course in the spring of 1990, the highest enrollment in the history of the course. "Students want it, but many can't fit it in their schedules because other courses that do fill distribution requirements are offered at the same time," she said. If more environmental courses could be counted as science classes, students would take them.

Levin agreed. "Interest in the environment is increasing every year, and I don't see that changing simply because environmental problems are not going to disappear."

Although Moore and Sultana want every graduate to leave Cornell with an understanding of environmental issues, they do not support the idea of requiring a course or two in the subject. "We would rather open courses up to people and have them go of their own accord," Moore explained.

Moore stressed the importance of raising everyone's environmental awareness since people need to realize their actions have a large impact on the environment. "Consumers need to have some knowledge of the issues so they won't need to rely on facts produced by companies who may be harming the environment," he said.

Environmentally literate students understand the symbiotic relationship between humans and environmental systems, Levin said. "We need to expose them to the problems and the possible solutions that exist, and encourage action," he explained. The ag college has certainly taken the first step in considering such programs.
HORTUS FORUM TODAY

by Andrea H. Retzky '91

HORTUS FORUM: FROM THE LATIN Hortus, meaning garden, and forum, outside space. As a forum is now defined as an outlet for discussing common interests, this is a fitting epithet for the Cornell organization of plant-lovers.

"Anyone who likes plants" is welcome to join Hortus Forum, according to its president, Michael McLaughlin '91. Most of the 40 members of Hortus Forum are plant science majors, with concentrations in pomology, vegetable crops or floriculture and ornamental horticulture. Hortus Forum is a chapter of the American Society for Horticultural Science, to which it reports.

The media have recently focused on the future of the earth's environment, from the potential "greenhouse" effect to the Clean Air Bill. Cornell is embracing the movement to increase environmental awareness, as students and faculty participate in University and Ithaca recycling programs. Several speakers have come to the campus to discuss the many threats to the safety of our environment and to propose possible solutions.

With all of this activity on campus, it is no wonder that an organization such as Hortus Forum is also involved in the environmental cause. Hortus Forum participated in Earth Day 1990, an international celebration of the earth and our need to protect its resources, held on April 22, 1990. Cornell's Earth Day festival, held on the arts quad, was filled with activities, lectures, musical performances and information booths. Hortus Forum operated a booth displaying "native woody plants for wildlife habitat improvement," according to Carl Haefner '92, an Ecology House resident and member of Hortus Forum, who organized the booth.

Haefner, the secretary of Hortus For-
by Melanie Bloom '91

"IF YOU CAN MAKE IT THERE, YOU can make it anywhere, it's up to you, New York, New York," sang Frank Sinatra on the tape recorder, as an eager group of hard-at-work Cornell students in the Cornell chapter of the Public Relations Student Society of America (PRSSA) hummed along. According to Sinatra, the ultimate challenge of success lies in "New York, New York," precisely where the PRSSA Cornell Conference committee is hosting the 15th Annual PRSSA Conference on November 3-7, 1990.

"NYC is up, it's theatrical, it's jazzy," explained Karin Schwartz '90, 1989-90 PRSSA Cornell President and 1990-91 PRSSA National Public Relations Director. "It's going for the best, like Sinatra says," Schwartz added. Hence, it's the place where The Sky's the Limit, as the umbrella theme for the conference reads, and where "Public Relations in the 1990s" is the focal point of the entire conference.

The Sky's the Limit...

Public Relations in the 1990s

The conference theme "implies growth and new heights, and refers to the opportunities available to students entering the public relations profession in the new decade," said Judi Germano '91, Conference Coordinator. In addition, Germano explained that this theme plays off the aspect of the New York City skyline as it portrays the overall attitude designated by the planning committee in the initial stages of conference development. "Just as the New York skyline is outstanding and extensive, the conference committee is prepared to do everything it can to make the 1990 conference outstanding and extensive," she added.

PRSSA was founded in 1968 and is an organization that caters to pre-professionals in the field of public relations. In past years, students in PRSSA nationwide attended the sessions of the annual conference for the Public Relations Society of America (PRSA), the largest organization of public relations professionals. Then in 1976, Maureen Pater, the first PRSSA National Chair, decided to coordinate a separate student conference at the same time and in the same city as the PRSA conference. That marked the beginning of a series of PRSSA-PRSA conferences which took place simultaneously in the fall of each year. In 1988, it was Cincinnati; in 1989, it was Dallas; and to welcome the new decade of 1990, New York City was chosen for the PRSSA National Conference 1990. "It's the perfect place to highlight public relations in the 1990s. It's the country's heart of business, culture, and public relations," Germano said.

Even though the location for each conference is determined years in advance, the university that hosts the conference is not. Schwartz explained that ever since the '88 conference in Cincinnati, some Cornell students have discussed the possibility of offering to host the conference. "We have been thinking about this for a while," Schwartz said. Their dreams became a reality in October, 1989, when Schwartz, Germano, and Cornell PRSSA National Liaison Barbara Petrasuska '90 presented a proposal to the bidding committee in Dallas. "It consisted of a complete description of everything we intended to do: the theme, session ideas, social events, communication strategies, the budget, and rough artwork," Schwartz said. In addition to the laser printed and bound copies of the written proposal, the presenters also used overheads and entertained questions pertaining to their proposed plan of action. "The bid blew everyone away," Professor Donald F. Schwartz, professor of communication and Faculty Advisor of the Cornell PRSSA, said. "Sean Essex of Hill and Knowlton [Worldwide Public Relations Council] Chicago told me that Cornell's presentation was more polished than some of the presentations he has seen at Hill and Knowlton," he added.

The announcement in Dallas of Cornell University as the host for the New York City conference signified the beginning of a long haul of continuous organizing and planning for the event. Nevertheless, the fast pace of the conference planning committee was established instantly. The same day that Cornell's PRSSA chapter was announced as the host for the 1990 conference, a survey was distributed to the students in Dallas for the 1989 conference to ascertain what the students wish to obtain from attending PRSSA conferences. "The surveys indicated that the students want to increase their personal skills in the field of public relations, as well as increase their opportunities to network with professionals in this field," Germano said. "So, we are presently working with PRSA to develop ways to increase student-practitioner interaction," she added.

With this in mind, the new hosts began the process of organizing the conference. Program planning, communication strategies, and logistics all had to be considered. Directors were selected for each of these three main areas and committee members were recruited for each department. The three directors working under Germano's supervision as Conference Coordinator are: Cindy Trice '91, Programs, Kimberly Blake..."
'92, Communications and Kristen Lawrence '92, Logistics and Operations.

"Special features" of the conference are emphasized within each division in order to differentiate the '90 conference from those of past years. Uniqueness is a key factor since the conference coincides with the celebration of the new decade. "To keep with this idea, we have planned special sessions that were never offered in the past. For example, A Day in the Life' features representatives from New York public relations agencies and corporations who will discuss what it is like to work for their firm or company. 'Q & A with PRSA' presents senior practitioners from PRSA who will meet with small groups of students for an active question and answer session," Trice said. She also emphasized that another main goal is to attract speakers from a broad range of professions to give students clearer ideas of the public relations field they may choose to enter.

As a speaker recruiter within Trice's committee, Cristy Boccuti '91 began the recruiting process by distributing a packet of session ideas to public relations professionals in New York City and asking for their suggestions. "We went as far as trying to recruit President Bush to do a video address pertaining to his campaign on the importance of education and how the PRSSA Conference fits in with this," Boccuti said. As the theme of the entire conference implies, "We stop at nothing," she said.

"The success of the communications department to promote the programs relies heavily on what programs are planned," Stephen Weinstein '91, PR/Promotion head within the communications department, said. Once the program planning is underway, the communications department will work to creatively promote the conference nationwide to prospective PRSSA chapter participants. A postcard from the coordinator introducing the conference, brochures, letterhead and business cards have been produced to promote the conference. "We realize the importance of reminding students and faculty about the '90 conference and about what new and exciting special features we have to offer," Blake said. "Professionalism and consistency are two of our main objectives in reaching our communication goal. Every month we send a press release or fact sheets to the chapters so that they are exposed to and updated about the conference," she said.

Fundraising is a key factor and another special feature that the committee must address and promote. "Fundraising within each chapter is crucial because New York City is very expensive compared to other past conference sites," Blake informed. "Our work is cut out for us," Weinstein said. "The fact that New York City is the center of public relations is a plus, but we also have to 'sell' the unique aspects of the '90 conference in order to convince students and faculty that the conference is definitely worth attending despite high costs," he said. A new fundraising strategy instituted this year gave companies the opportunity to advertise in the Conference Program Guide. "This opportunity is open to anyone who wants to participate," explained Germano.

Meanwhile, the logistics department has been organizing housing and registration at the Penta Hotel, the site of the PRSSA Conference 1990. A Survival Guide prepared by the logistics and communications committees will be given to each participant upon their arrival to the Big Apple. "This special feature will include information on both how to get around and what to see in New York City," Lawrence explained. While the logistics department conducts the research on various transportation routes and tourist attractions, the communications department produces the information. The logistics department also depends on the communications department for the purpose of finalizing session room numbers, and confirming hotel arrangements at the Penta Hotel. Another highlight of the conference coordinated by the logistics department is the opportunity students will have to purchase Broadway tickets.

As Faculty Advisor, Schwartz is always available for consultation. "I view myself as a safety net whenever I am needed, but I do not think that I will be needed," he said.

With the 1990 conference quickly approaching, the programs department is busy confirming special events reservations and keeping speakers updated. After all their hard work, members of the Cornell chapter of PRSSA hope the Annual PRSSA National Conference 1990 will soar higher than New York's highest skyscraper. As Sinatra sang of the challenge of New York, "The sky's the limit!"
CLOSEUP ON

BUTTERMILKFALLS

EVERY YEAR, THE RITUAL IS THE
same all over the northeast. First, you
wait for the first really warm day of
spring to arrive. Second, you call in sick
to work or school. And third, you jump
in your car and head for your favorite
gateway spot for a day of rest and relax-
ation. Whether it be along the bank of
a river, on the shore of a lake or in the
middle of a field, millions of people all
along the eastern seaboard know of a
place where they can escape the prob-
lems of everyday life. Buttermilk Falls
State Park is one such place.

On the average summer day, Buttermilk
Falls (one of four state parks in
Tompkins County, located just outside
Ithaca city limits) is filled with people—
some playing baseball, others picnick-
ing or sunbathing, and others taking
trips along various nature trails. From a
human’s point of view, the setting is
idyllic. No noise. No pollution. No has-
sles. Just several hundred acres of state-
protected land to enjoy.

But there are two sides to the story. While Buttermilk Falls remains a great
getaway spot for the growing human
population of Tompkins County, it is
quickly becoming less and less idyllic
for the plant and wildlife populations
of Buttermilk Falls. Granted, there is
still a healthy plant and animal com-
nunity inside the park, but life there is
anything but peaceful. Human visitors
pose a significant disturbance to every-
day life, and the possibility of develop-
ment on the land surrounding Buttermilk
Falls is threatening to bring about slow
desecration inside the park itself.

The problem is two-fold. First, Butter-
milk Falls was never meant for recrea-
tional activities. It was intended to
be more of a nature preserve. And
second, when the park was formed, its
founders could not afford to buy buff-
ferland around the park, meaning that
today’s developers can theoretically
build anything they want right up to
the edge of the park. If such develop-
ment occurred, not only would it lock
the existing Buttermilk population
within park boundaries, but it would
also bring about slow salt and petro-
leum contamination, killing off or driv-
ing away most species inside the park.

Unfortunately, such development
seems to be all but a foregone conclu-
sion, according to Tony Ingraham, a
natural environmentalist for the state
park system. Technically, the state does
hold the power to acquire buffer land
around the park, but Ingraham said he
doubts this will happen in time to save
the park. “I don’t think the state is go-
ing to act fast enough,” Ingraham said.
“The whole procedure is too slow for
the rate at which land is being devel-
oped around here. The procedure is
slow and expensive, and given that
there are four state parks in Tompkins
County, the state is probably not going
to look at this as a high priority. I’m not
real optimistic.”

As for the problem of increasing hu-
man visitation, Ingraham sees a simple
solution, although he said he’s not so
sure it will ever come about. Tompkins
County holds the power to create park
districts to meet the recreational de-
mands of the growing population. If
certain lands around the county were
set aside for picnicking, baseball and
the like, Ingraham noted that people
would not have to come to a state park
for those activities. Notably, Ingraham
said, the same problems exist at the
county’s other state parks—the Robert
Treman State Park, the Alan H. Treman
State Marine Park, and Taughannock
Falls State Park.

Despite the imminent problems of
tomorrow, Buttermilk Falls remains
healthy today. From a waterfall, two
gorges, and numerous streams to plen-
tiful wildlife and bountiful plant life, a
trip through upper and lower Buttermilk
Falls is probably not much differ-
ent than a trip through what are now
Cornell University and Ithaca some 150
years ago. Cornell offers similar topo-
ographical and other natural characteris-
tics to upper Buttermilk Falls while
Ithaca—one marshlands—bears topo-
ographical resemblance to the lower
portion of the state park.

Vast differences exist between the
upper and lower portions of the park.
Ingraham described many of these
differences. On the lower end of the
park, the visitor is likely to run into
dogwoods, various shrubbery, willows,
walnuts and green ash, while the upper
park offers white pines, hemlock, beech,
sugar maple, oaks and black cherry.
As for wildlife inside the park, the
most notable differences between
upper and lower Buttermilk Falls exist
in the types of bird life. Throughout the
park, the visitor will run across beavers,
owls, deer, raccoons, squirrels, possi-
bly some mink, and even a coyote or two.
As in any wildlife system, most of the
species in Buttermilk Falls are either
omnivores or herbivores. Few carniv-
ores exist.

The bottom line? For now, Buttermilk
Falls State Park is a great place for
Ithacans to get away from it all. Fifty
years from now, however, there may
not be much left to get away to.
DETECTING LISTERIA

by Michele Pepe '91

About ten years ago, a technique for producing monoclonal antibodies, antibodies specifically geared toward a foreign antigen, was developed. Since then, these extraordinary proteins have joined the battle against salmonella, cancer and a variety of other diseases. Now, Carl A. Batt, assistant professor of food science in Cornell’s College of Agriculture and Life Sciences, together with his wife Jerrie Gavalchin, a cellular immunologist at the SUNY Health Science Center, and Mary Lou Tortorello of Cornell’s Department of Microbiology, has developed three new monoclonal antibodies. These will be used to detect the Listeria monocytogenes bacterium in food and in patients suspected of having a spinal infection called listeriosis, or listeria meningitis.

To develop the trio of antibodies, Batt and his colleagues cloned many descendants of an antibody-producing cell. The antibodies produced by this cell can recognize and bind specifically to the Listeria monocytogenes bacterium. The clones of the cell were then used to mass produce these antibodies.

While the genus Listeria consists of six or seven different species, only the L. monocytogenes species induces illness in humans.

Listeriosis strikes at least 1,700 people and claims up to 400 lives every year in the United States. “Listeria monocytogenes is not in itself a deadly pathogen,” Batt said. “The symptoms of listeriosis are, in fact, flu-like and unspectacular. Only a culture can positively affirm that listeria is the disease-causing organism,” he added. “Listeriosis is a problem, but it’s being dealt with. I think it’s really important that people understand this.”

Consuming contaminated foods can result in listeriosis. “You’ve eaten listeria. Probably everyone on the face of the earth has eaten listeria,” Batt said. “But those people whose immune systems are not working to full potential (immunocompromised) are most susceptible to listeriosis.” This group includes young children, pregnant women, older people, AIDS patients and others with reduced disease resistance.

Foods most implicated in the carrying of L. monocytogenes include dairy products, ready-to-eat meats, poultry products, seafood and vegetables. “The bacterium,” Batt said, “has been found a lot in cabbage and coleslaw. And something like 30 percent of all radishes carry the organism as well. But given that this is a bacterium present in the soil, it’s only natural that foods grown in soil should carry it.”

According to Batt, current food-testing methods for the bacterium take too long. He explained that the bacterial flora in foods consist of many different bacteria and that listeria is in no way biochemically distinct from the rest. “The only way to isolate this particular bacterium,” he said, “is through a process called ‘cold enrichment.’” This means that the bacterial culture is maintained at very low temperatures amenable to the growth of listeria. “The problem is,” Batt said, “that cold enrichment takes time. The safety of food products prior to their consumption is therefore not assured.”

The diagnostic test that Batt and his colleagues are developing should take only a day or two compared with up to two weeks for current tests. And in terms of testing for the bacterium in patients, it is essential that a quick diagnosis be made since several other organisms besides listeria can cause meningitis.

Batt said that the new diagnostic test involves the attaching of “markers” (such as fluorescent dyes or color-generating enzymes) to the monoclonal antibody. “First we put the culture [that is suspected of carrying the L. monocytogenes bacterium] on a slide and allow it to incubate,” Batt said. “Then we allow binding between the antibody and the bacterium. The bacterium is the antigen, or the molecule recognized by the antibody. The fluorescent dye acts as a reporter molecule. When it glows we know that the antibody has found and attached to the L. monocytogenes bacterium. Then it’s just a matter of washing away any unbound antibody to reveal the highlighted bacteria.”

Although similar antibodies were developed at Emory University in 1984, this is the first time that they are actually being used to develop a quick diagnostic kit. “This kind of test,” Batt said, “will improve food safety for the consumer and thus minimize listeriosis outbreaks.”

While listeriosis is still a serious problem, Batt commented that it is certainly not the next bubonic plague. Efforts toward developing new monoclonal antibodies are an important part of combating this disease.
Evaluating Cornell

WHO IS MAKING SURE THAT WHEN the bulldozers come to put in a new parking lot at Cornell they do not take down the old white oaks that may have been standing since Native Americans inhabited the area? Who is out there protecting the views of Cayuga's waters we have all enjoyed from several locations on campus?

The trustee-appointed University Special Areas Committee comes to the rescue. Since late in 1988, the committee has been meeting every two-and-a-half to three months to evaluate all buildings and special areas on campus. They give each building and the space around it a ranking which is determined by the area's historical, horticultural, and traditional significance.

Dr. Alain Seznec, Carl A. Kroch University Librarian and Professor of Romance studies who served as dean of the arts college from 1978-1986, is chairing the committee.

"We familiarize ourselves with the building before we meet, and then we are given a brief presentation about when the building was built, who funded it, and how important the architect was who designed it. We evaluate everything," Seznec explained. "We are then able to alert the decision makers at Cornell when they approach a building or area for renovation," he continued.

Nancy H. Goody, campus planner, does most of the ground work for the committee which should complete its evaluation in the year or two. She explained that the committee has three rankings. The first includes the most significant buildings and areas on campus. For example, McGraw Tower, an important part of the University skyline, as well as being historically and architecturally significant, would be given an A rating.

The next rating contains buildings which could be altered to some extent, and the final rating specifies those buildings or areas which could either use considerable improvement or have virtually no aesthetic value whatsoever. The plaza in front of Bailey Hall falls into this category because it has become a parking lot for construction workers.

"Bailey Plaza deserves to be an A, and we would suggest this," Goody reiterated. Professor of Floriculture, Carl Gortzig '52, explained, "Bailey Plaza is important because it interfaces the statutory and endowed colleges. It is also the foreground of Bailey and Malott Halls and an important crossroad on campus."

As a horticulturist, one of Gortzig's roles on the committee is to help identify the significant green spaces on campus, such as those around what is called the "red brick campus" or Sage Hall, Barnes Hall, and Sage Chapel. For instance, on the south side of Sage Hall there are two exotic trees, a bald cypress and an Austrian pine. "Part of the original Cornell Arboretum and the botany department were located in the back wing of Sage Hall," Gortzig said.

"Library Slope is a much-valued green space on campus because it is both the foreground for the first buildings built at Cornell and for West Campus. It is also an area which carries much tradition for alumni, such as Springfest and other events," Gortzig explained. He also noted the existence of the very large white oak on the slope behind Willard Straight Hall, which likely dates back to pre-Cornell when the Native Americans lived here.

An area under recent evaluation was the Henry W. Sage family complex off East State Street in Collegetown. Liberty Hyde Bailey, a former dean of the College of Agriculture, designed and built his house on this property. He bought the carriage house from the Sage complex and converted it into a hortorium.

"The carriage house was very important in botanical history, because it was the first herbarium devoted primarily to cultivated plants. Bailey was a world-famous horticulturist and botanist, and therefore the committee gave this area our top rating," Gortzig said.

"The committee gives a snapshot of what the value of the campus is in 1990. In 20 years who knows if they will still value the same architecture that we value today," Goody said. The committee is not intended to be a barometer rating as to whether a building is functional or not.

"We don't look at the square footage of a building or if the research that goes on in its laboratories pays the bills at the University. It has to do with aesthetics, architectural significance, and history," Goody explained.

According to Seznec, "Twenty years ago if something was old we got rid of it; now we recognize it as part of our heritage. The point is not to be anti-quarian, but to make sure the things we have inherited are maintained. I think there is a new spirit out there and we have definitely taken a step forward."

by Emily A. Hoffman '90

Liberty Hyde Bailey's house, located in the Henry W. Sage family complex in lower Collegetown, was given the highest rating by the committee.

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Cornellians Receive Distinguished Awards

Eric J. Sussman, a senior in the College of Agriculture and Life Sciences, is the 1990 winner of the Nelson J. Shaulis Advancement of Viticulture Award. Sussman, a native of Long Island, New York, received a $1,900 scholarship to spend 12 weeks working with scientists who study viticulture (cultivation of vines and grape growing). Sussman, whose major at Cornell is environmental technology and agricultural systems, worked over the summer under his advisor, Robert Pool, professor of viticulture at Cornell’s Agricultural Experiment Station in Geneva. The Shaulis Fund was established in 1979 to honor the many contributions made by Nelson Shaulis, professor emeritus of viticulture at the Geneva station.

Donald K. Freebairn, professor emeritus of agricultural economics, has received a 1990-91 Fulbright Scholar Grant. Freebairn will lecture at the Colegio de Postgraduados in Mexico from September, 1990 to July, 1991.

Barry Cooper, associate professor of pathology in the College of Veterinary Medicine, is one of five recipients of 1990Ralston Purina Small Animal Research Awards. The award is given in recognition of original and significant research. Cooper provided the first definitive evidence that muscular dystrophy occurs in domestic animals.

Yong H. Kim, a science writer for Cornell News Service, has received two top awards this year for his 1989 article on a technique developed at Cornell for removal of 90 percent of the cholesterol from milk. Kim was first-place winner in Writing for Newspapers in the 1990 Critique and Awards Program of Agricultural Communicators of Education. His article also received the Northeast Farm Communicators Association’s 1990 award for the best general farm news story for print media. This is the ninth straight year Kim has received writing awards from the ACE and the sixth consecutive year from Northeast Farm Communicators Association.

Thomas Eisner, the Jacob Gould Schurman Professor of Biology, and Jerrold Meinwald, the Goldwin Smith Professor of Chemistry, have jointly received the 1990 Tyler Prize for Environmental Achievement, widely considered the largest and most prestigious award for environmentally related sciences. The Tyler Prize Committee called Eisner and Meinwald the "founders of chemical ecology," an emerging field of science dealing with the chemical interactions between organisms in nature. The scientists were also cited by the committee for their "elegant synthesis of biology and chemistry." Meinwald and Eisner have been members of the Cornell faculty since 1952 and 1957, respectively, and have collaborated for over 30 years.

CU Professor Named Dean of Agriculture at UC Davis

John E. Kinsella, the Liberty Hyde Bailey Professor of Food Chemistry and General Foods Distinguished Professor of Food Science, was appointed dean of the College of Agriculture and Environmental Sciences at University of California at Davis. Kinsella, who assumed his new position on September 1, also now serves as the director of the university’s division of Agriculture and Natural Programs. A member of the Cornell faculty since 1967, Kinsella served as chair of the Depart-

ment of Food Science from 1977 to 1985 and also as director of the Institute of Food Science from 1980 to 1987. Kinsella has carried out extensive research on the impact of fatty acids on nutrition and health and is an internationally recognized authority on lipid biochemistry.

Two Women Launch KIDStoday

Elaine Ferguson and Lis Murray ’77 recently launched a new magazine for parents called KIDStoday. The premiere issue of their quarterly publication debuted in March. The brainchild of Ferguson, the president and publisher, the magazine is a handy source of information for busy families who are interested in local, family-oriented activities, products and services. Murray says she hopes to capture top-notch events and services that can make child-rearing really special—including articles on parenting, nutrition and fashion; a comprehensive calendar of area events; and movie reviews giving kids’ opinions of family films.

Walker, a “Special Student”

John Richmond Walker was a “special student” of the College of Agriculture and Life Sciences from 1928 to 1933. As a New York resident, he paid no tuition, and as a special student he took his own choice of courses and played a wide variety of sports. Walker received room and board for a time from a professor of agricultural economics, for whom he serviced a furnace, washed dishes, served food, and did other chores. Walker was a lifetime member of the Cornell Alumni Association and yet never received his diploma from Cornell. He completed all required ag courses but lacked a foreign language requirement. Walker died in February at the age of 84.
Around the World

CORNELL UNIVERSITY, RENOWNED for its educational opportunities and beautiful campus, has been attracting a diverse student body to Ithaca for over 100 years. The 2,138 foreign students enrolled during the 1989–90 academic year demonstrate Cornell’s worldwide reputation. Seventy-one percent of these students are undergraduates in the College of Agriculture and Life Sciences. Cornell offers international students the opportunity to participate in exchange programs, work on research projects or play sports while obtaining an excellent education in a hospitable environment.

Cornell. The College of Agriculture and Life Sciences sponsors an exchange program with the Agricultural College of Sweden. Anna Ekman, one such scholarship recipient, spent the 1989–90 academic year in Cornell’s landscape architecture curriculum.

Ekman arrived the United States six weeks before classes began. “Cornell arranged for me to stay with a family before the start of the semester to practice English and have the opportunity to experience American life and not just school life,” said Ekman.

Cornell also attracts international students by recruiting for sports teams. Rebecca Schmalz ’91, of Canada, was recruited to play women’s ice hockey. “I was recruited at other colleges, but Cornell is a great place,” said Schmalz. “I get a good education as opposed to an academic scholarship. I felt this was a strong drawing point.” Schmalz, a communication major, also said the Canadian colleges that recruited her did not offer a communications curriculum. “I would be studying English if I went somewhere else.”

To further encourage foreign students to attend Cornell, the ISS at Cornell offers a variety of programs to make the transition to a new country easier. The office organizes a special orientation program, including small groups led by continuing foreign undergraduates, to enable students to share experiences and information. To inform students about the academic atmosphere at Cornell, the office runs seminars on registration policies, financial aid and housing.

The ISS schedules many activities including weekly international coffee hours and sightseeing trips. These trips bring students to areas they might not visit on their own such as Niagara Falls, Philadelphia, New York and Washington D.C.

The International Students Programming Board often sponsors holiday dinners over Thanksgiving and Christmas and a July 4th picnic is held for those who remain in Ithaca. Ekman lives in the International Living Center (ILC) on campus. The ILC provides an area where students of different cultures can live together. “There are American and international students living there,” she said. “It helps to be around other people who stay at school during breaks when you don’t have a family as close as others do.” Reiss said the ILC houses a maximum of 144 students and 40 percent are Americans. Only a small percentage of the foreign students live in the center, but Reiss said she feels it creates a good atmosphere that’s conducive to adjusting.

In addition to the welcoming environment, sports recruiting, research opportunities and exchange programs, one of Cornell’s greatest assets is its academic excellence. Ekman said, “It is the great wealth of knowledge that strikes me the most.”

by Teri B. Kestenbaum ’91
About the Issue

Before blacktop roads and parking lots, dirt roads and horse carriages were a common sight on the Cornell campus. This issue of the Cornet Countryman takes a look back at the "Cow College" and its growth into a busy building-lined quadrangle. Life for the female undergraduates in the past is explored, and long-time CALS faculty members are profiled. The Countryman also looks ahead to more budget cuts and the promise of some solutions to poverty and world hunger.

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It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to, or be denied participation in 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, sexual preference, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.
RUMORS HAVE CIRCULATED AROUND the College of Agriculture and Life Sciences for years about merging two or more of the plant science departments. This year rumor became fact on July 1, 1990, when the departments of vegetable crops and pomology joined to form the Department of Fruit and Vegetable Science.

The fruit and vegetable industries have changed since 1912 when Liberty Hyde Bailey, then dean of the agriculture college, split the Department of Horticulture into vegetable crops, pomology and floriculture. According to David L. Call '54, MS '58, PhD '60, dean of the College, links between the fruit and vegetable industries have become closer, and "processors and producers are handling both." Consolidating the areas would make Cornell "better able to serve the needs of industry."

Replacing two small units with one modest-sized one should also produce an administrative savings. "We are always looking for program efficiencies," Call said. State budget cutbacks were not a major factor in the merger, Call said, but they did affect the decision.

According to Elmer E. Ewing PhD '59, chair of the new department and former chair of the Department of Vegetable Crops, there are many career opportunities in fruits and vegetables but not enough students to fill them. These industries in New York state are substantial, with farm value (before processing) of the fruit industry in the state estimated at $150 million and the vegetable industry estimated at $260 million per year. "One objective is certainly to increase the number of undergraduates in fruits and vegetables," Ewing said. With the merger only months old, the new faculty members are just beginning to make plans for future directions. Ewing said both departments have traditionally given strong extension and applied research support to industry, and he assumes this will continue.

Cooperation between the two areas and with the Department of Floriculture and Ornamental Horticulture began a few years ago with an interdepartmental teaching committee to review courses. Such cooperation offers "a better integrated program in plant science for undergraduates," Call said. In addition, pomology and vegetable crops had been offering a joint fall seminar.

Pomology brought seven faculty to the merger and vegetable crops 14, for a total of 21. The combined support staff (clerical and administrative staff, technicians and other workers) is now 37, and the graduate student population has gone from 21 in vegetable crops and 11 in pomology to 32 in fruit and vegetable science.

The new department's name was suggested by a faculty member from pomology and received the support of a majority of faculty in the two departments. Ewing explained that often people did not know what "pomology" meant or mistakenly thought it pertained only to apples and other "pomme" fruits. The new name presents a clear picture of the areas involved and the scientific focus of the department.

Ewing said he hopes the new department will be aware of the "working spirit," the sense of family, that both departments had fostered. He said the departments had a tradition of close- ness and support among the faculty, staff and graduate students. Returning alumni often say they miss the family feeling of their years with vegetable crops or pomology.

The merger will provide resources that were previously available only within each department, such as the use by vegetable faculty of the "excellent chemists" in the former pomology spectrograph laboratory.

"We seem to be off to a good start," Ewing said. "I'm very optimistic.""
Budget to the Bone

By Jeffrey S. Popow '91

workload for the present staff and that faculty members now do a lot of the work that secretaries used to handle. Tomek added, "If we see cuts next year, we could not get by without layoffs."

Research and outside projects are also feeling the budget crunch. These programs are vital not only to university departments but also to New York state. Johnson said, "As a land-grant university, we see a tremendous opportunity to help the people of New York state." Johnson commented that Cornell has the people, the expertise and the techniques to deal with problems such as the environment but, without the money, can do nothing. Tomek commented that one of his faculty vacancies is in environmental policy and extension education and that important public policy issues such as these will not get the attention and research they need. According to Elliot, as budget cuts increase, so does pressure on faculty to get outside grants for their research.

One big problem Tomek faces is that all graduate students and teaching assistantships have been shifted from twelve- to nine-month appointments. This shift officially takes effect in the summer of 1991. Tomek said, "This will affect our ability to recruit graduate students. Peer universities offer twelve-month appointments. We haven't decided how to grapple with this in the future." Richard A. Ledford, chair of the Department of Food Science, echoed a similar concern. In lieu of eliminating graduate assistantships, he hopes that outside support and grants can pick up the slack. According to Ledford, this strategy has worked with research technicians in his department. All technicians are now on grant funds, he said; state-supported positions no longer exist.

At least one department—animal science—has revenue from outside projects to help offset budget cuts. Elliot said, "We have an advantage in that part of our resources comes from milk and the sale of animals. To raise more money, we raised the milk production per cow." According to Elliot, this outside revenue has helped the department survive.

Other less noticeable effects are in the area of financial support for faculty. Both Colle and Tomek remarked that they have cut back on support for professional meetings of faculty members who may be presenting papers or travelling to support their research efforts.

Some programs in the College survive because they are self-supporting. For example, the dairy operations in the Department of Food Science do not turn a profit. They break even and use their revenues to pay salaries and other expenses.

What about the future? According to Johnson, state taxes are not coming in at the same rate as last year; revenues are down, and more cuts can be expected. Some point to a raise in SUNY tuition as the answer, but this is not the panacea everyone thinks it is. Johnson said, "If tuition is raised $100, this generates $10 million in additional revenue." But, Johnson added, SUNY faces a $300 million operating hole.

Johnson said that state officials need to take a realistic look at priorities and view education as "an investment rather than an expenditure." Several department chairs agreed, calling the educational cuts "short-sighted."

Faced with the loaded question of how to deal with further cuts, most department chairs throw their hands into the air in despair. They don't have any answers. The consensus is that there's not much left to be cut. Poston commented, "If we keep shaking the tree, nothing else is going to fall out." Ripple remarked, "We have cut past the fat, past the muscle; we're into bone now." He added, "The cuts are real and disastrous, and we can't take any more."
New Horizons for FOOD SCIENCE

MOST READERS ARE FAMILIAR WITH the Cornell dairy—Cornell milk, Cornell ice cream, and even Cornell cows. Now, more than a century after its first small dairy plant was established in 1880, the Department of Food Science has a facility for studying more than dairy products.

The Food Processing and Development Laboratory "is the largest expansion of its kind at Cornell in 65 years," said John Brown, manager of the facility. The $6 million project was funded by a direct appropriation from the New York state legislature. Begun in July, 1986, it was completed in September, 1988, and turned over to the College of Agriculture and Life Sciences.

Why was the project executed at Cornell? According to Brown, the state saw a need for the facilities that the laboratory would provide, both for the Cornell community and for the state's food industry. Among its features are separate laboratories for food chemistry, analysis and instrumentation; 11 walk-in chambers that can be controlled for temperature and humidity; a machine shop and its main facility, a 10,000-square-foot pilot plant.

The pilot plant provides the space and the state-of-the-art technology to develop and test new products and processes, contributing greatly to teaching and research in food science. But what makes it valuable to the state's industries (particularly to small companies that cannot afford research and development facilities of their own) is its capability for unit-type operations, according to Bill Anderson, senior administrator of the food science department.

Small-scale production in the pilot plant can provide enough of a product for test marketing. For example, laboratory technicians are working on production of goat's-milk ice cream with Goat Folks, a firm based in Interlaken, New York. Next spring, the dessert will be test-marketed through 31 Wegmans supermarkets.

Manufacturers of food-processing equipment also benefit from using the pilot plant. Although the new laboratory's construction budget included an allocation for purchasing equipment, Cornell rents or leases several state-of-the-art machines to test the capabilities of the pieces and to demonstrate a particular function or action to students and industry representatives. Tetra-Pak Inc.'s TR-7 milk packager is here on a three-year lease; Wenger Manufacturing Co.'s TX-52 Food Extruder is on a five-year loan. Each piece is the most advanced in its field and is worth over $400,000. Anderson pointed out that the manufacturer and the department both benefit from such an arrangement.

"This pilot plant is ideal for processing and product development," explained Sy Rizvi, professor of food processing and engineering, during a test run of the Wenger extruder. "Having Cornell test the piece is more economical for the company, and students get hands-on experience with the equipment," said Rizvi.

"We can make so many different products from one machine," said Steven Mulvaney PhD '87, the department's new assistant professor. He said that one goal for the extruder is to use it for New York-produced foods that can be processed using its heating, cooking and forming functions.

The laboratory's range of capabilities makes it useful to the food science department and to industries in and out of New York state. It also serves state and federal programs. As one of six dairy centers in the United States, Cornell was selected, along with the University of Vermont, to establish the Northeast Dairy Foods Research Center, said Anderson. Five-year funding is being used to research many projects within the food industry; one project based at the lab studies the effects of temperature and humidity on the shelf life of milk. Another experiments with the filtration and further uses of whey, a by-product of cheese production. Food scientists are also experimenting with cheese, speeding its aging to produce cheese faster or slowing it to improve the flavor.

As the next century approaches, Cornell's Department of Food Science is prepared to stay at the forefront of food technology, leading the way with the knowledge gained in the Food Processing and Development Laboratory.

by Dana A. Celentano '91
TEACH

A BRIGHTER FUTURE FOR AMERICA's children—it would appear to be an intangible dream, but thanks to the vision and commitment of Teach for America, that dream is quickly becoming a reality.

The future of America's youth is perhaps most threatened by the state of the nation's education system. Educational reform is a challenge that calls for an increase in the quality and quantity of teachers, and the Teach for America program has sought to do both.

Based on the Peace Corps model, Teach for America is a non-profit organization that recruits on a national scale. The program has a selective application process, a short time commitment and a training and placement mechanism to entice liberal arts graduates and mid-career professionals who would not otherwise consider teaching. Through campus representatives, Teach for America recruits at 100 universities and colleges around the United States. The idea is to attract a unique niche of individuals—those with the most other career opportunities—by creating a powerful sense of service, selectivity and status. The program is most interested in recruiting minorities and those who majored in math, science and foreign languages. The program is a two-year commitment and involves teaching elementary and high school students in the rural and inner city areas where the quality and quantity of teachers are the lowest, such as Mississippi, Washington D.C., and east Los Angeles.

Teach for America is the brainchild of recent Princeton University Graduate

Wendy Kopp, who developed the concept for the program in her senior thesis. With the help of recent graduates from other universities in the northeast and initial funding from Mobil and Union Carbide, Teach for America was made possible. A corps of 500 teachers have just finished their first month of teaching.

While Teach for America has received acclaim and support from some of America's largest corporations, the program has been criticized by members of the education community. Professionals feel that the Teach for America program is negligent because it offers an alternative to teaching certification.

Keary Howard MS Education '91, Teach for America's Cornell representative, said that Teach for America has a different view, that "teaching is an art, a skill that you learn and get better at by doing it rather than studying it; studying about teaching does not necessarily make you a better teacher."

"Our corps of teachers have a strong fundamental understanding and background in their subjects. Teaching is a matter of how you can communicate information and how you relate it to your students. That is the basis for becoming an excellent teacher, and that is what Teach for America strives for."

Howard points out that recognizing a need for a better quality of teacher is not enough. Something has to be done to solve the problem, and that is what Teach for America is working towards. According to Howard, "Teach for America gives the school districts that desperately need teachers, the teachers they need while giving qualified people who want to teach the opportunity to teach. These teachers are going to make a difference two years down the road. If it is a program that is producing good teachers, then it is a program America needs to have."

In its first year, Teach for America has put 500 new teachers where they are needed the most, promising a brighter future for students. Teach for America has people teaching today. ■

by Hilary Nagler '91
Poverty, Feeding

by Alex J. Nussbaum '92

THE COLLEGE OF AGRICULTURE
and Life Sciences is mobilizing to fight a war. The enemies are hunger, malnutrition, economic inequity and environmental degradation. The victims are the nearly 3.75 billion people living in the less-developed, low-income countries of Africa, Asia and Latin America. The College's newest weapon is the Cornell International Institute for Food, Agriculture, and Development, or CIIFAD.

Earlier this fall, the ag college received an anonymous gift of $7.5 million, the largest gift in the history of the College, to establish CIIFAD. Administrators and professors are hoping the institute will be able to provide some answers to the problems gripping the people of the third world.

"The problems have never been more serious," said Professor Joseph Stycos, director of the ag college's Population and Development Program.

"Between the rising level of expectations of populations around the world and the increase in the number of people, the demand for food and other necessities and luxuries has created tremendous pressure on the world for greater food resources and economic production. And there are many political problems complicating those issues," said Stycos.

To tackle those issues, organizers of CIIFAD hope to do what they say has been done all too infrequently in past international development research—use an interdisciplinary approach. It is hoped that more complete, in-depth studies of development issues, studies that cut across academic lines, will be better able to solve third world crises.

"One of the unique things about CIIFAD is that it's going to approach the problem from an interdisciplinary standpoint," said agricultural economics Professor Daniel Sisler PhD '61.

Sisler led the faculty group that drafted the proposal for CIIFAD. Sisler added, "Most research related to developing countries is done on an individual, disciplinary basis. The agricultural economists go out and study a problem; the plant breeders go out and study the problem; the demographers; the nutrition people. We're attempting to take the major issues and look at them in a more interdisciplinary way."

As an example of the kind of multidisciplinary solutions CIIFAD will promote, Sisler cited the case of Uganda. "Right now, Uganda gets 90 percent of its foreign exchange earnings from coffee," Sisler explained. "At the present time, world coffee prices are low; at best, Uganda confronts wide swings in foreign exchange earnings."

An economist could take a look at how Uganda can diversify its economy, Sisler said. But he added that wouldn't be enough. "We must take into account how achieving this diversity may affect human nutrition and the environment. We hope a team can look at these problems simultaneously, so the government of Uganda gets guidance as to how to make adjustments. In working with the government, CIIFAD will provide guidance from the economist, from the demographer, from the nutritionist, and from the environmentalist," said Sisler.

Sisler and others involved in CIIFAD were cautious in their optimism. They admitted that fostering such a multidisciplinary approach will be easier said than done. Said Sisler, "We're somewhat apprehensive as to exactly how you get this done. A university is struc
the World

tured along disciplinary lines. We'll have to do a good job of formulating the programs and efforts CIIFAD will participate in to ensure we'll have interdisciplinary work.” Stycos called CIIFAD’s collaborative goal “a tough proposition. There have been efforts like this before, but they’ve had a high mortality rate.”

Ag college Dean David Call ’54, MS ’58, PhD ’60, agreed. But Call, who has been working with other faculty members to organize CIIFAD, said Cornell and the ag college have a long track record of success with broad-based research. Call added, “We have a history of dealing with problems. We'll be strengthening efforts and attracting new faculty members to do multidisciplinary work. When you're asked to address a real problem, it's not just a technical or an agricultural problem. There are cultural issues, technological issues. All of these things have to come together in order to design and recommend a policy.”

Call described another major goal of the institute as training students from the third world. “A principal thrust is developing human capital,” he said, “people who go back to their own countries and provide leadership in solving their own countries’ problems.”

Towards that goal, the first CIIFAD fellowship was awarded this fall, according to Stycos, to a Ugandan graduate student. The fellowship promises two years of financial support for research into population issues. Sisler said the institute has committed to help fund other projects as well.

Ag college undergraduates will benefit from the CIIFAD program. Call said, “It helps us move towards a goal which we have had for some time, which is globalization and a more international focus to our total curriculum. We believe strongly that students are going to have to face a shrinking world in the future, so we want to provide a broader experience.”

Educational and scientific efforts will reach beyond the ag quad as well. Call and Stycos said the ag college will call upon alumni to contribute to CIIFAD, with Call noting, as a testament to CALS strength in international development research, that the College has alumni in 98 countries around the world.

“I hope we will be able to involve alumni in a meaningful way,” said Stycos. “We have alumni around the world as well as in the United States. With an exciting international venture like this, we hope to count on the technical and financial assistance of alumni in the fields in which we are concerned.” Call seconded that thought, “Alumni, particularly those that are internationally oriented, will hear about it.”

So far, CIIFAD is still in the planning stages. Sisler said it is hoped that the organization’s focus and structure will be nailed down by the beginning of 1991. Despite the youth of the program, those involved are already showing confidence and taking pride.

“It’s going to be very challenging,” said Call. “We’re going to try something different, something that’s never been done before. I think we’re up to it. In a time when our resources are shrinking, this is a welcome vote of confidence that something we’ve been doing for a long time is being recognized.”
How Everett Stiles Got to Cornell

"ALL ABOARD! NEXT TRAIN TO . . .
Ithaca!!" yelled the train conductor.

WHAT??
Cornell students usually arrive on campus from home in time for classes
by car, plane or even by bus. Everett L.
Stiles '34, however, could get to Cornell
directly only by taking the railroad,
which today is impossible.

"Back in those days, roads weren't
opened yet, so cars weren't too popu-
lar," Stiles recalled. "Also, cars were ex-
pensive. So we traveled by horse and
sleigh. But for traveling long distances,
the railroad was very common."

Stiles began his career at Cornell's
College of Agriculture in January, 1930.
He and his parents started their trip to
the local train depot one cold January
morning at 6:00 o'clock. From their
farm in Richville, New York, about 150
miles northeast of Ithaca, Stiles had to
brave very low temperatures that day.
"It was so cold, my ears froze while we
were on the sleigh," Stiles remembered,
chuckling.

At the train depot, Stiles and his
father told the ticket agent that they
wanted a ticket to Ithaca. "Our railroad
agent looked up in his big book for
charges and tickets and told us we
would first have to go to Syracuse, then
to Auburn and only then to Ithaca,"
Stiles said. At 7:30 a.m., he waved
goodbye to his parents and walked
onto the train with only his footlocker
containing personal possessions.

A great surprise, however, awaited
Stiles in Auburn. "The railroad line to
Ithaca had apparently been closed two
or three years before then," Stiles said.
"Finally, the railroad people came
up with a way for me to get to Ithaca, but
only through Freeville and then to east
Ithaca."

He finally arrived in east Ithaca
at 9:00 p.m. "It was junior prom night at
Cornell, which I'm not sure you have
anymore, so a lot of people who did
have cars had decided to work for some
taxi companies that night," Stiles said.
He found a taxi, but the driver could
not carry or fit Stiles’ footlocker
into the car, so it was left at the station.

"I knew of a friend of a friend in Thet-
a Kappa Nu fraternity at Cornell, and I
had been told to look him up if I ever
needed anything, so I told the driver to
take me there," Stiles said. The fra-
terity's house was located at 313 Wait Ave-
nue (which is now the annex house of
Delta Delta Delta sorority). The driver
did not know the exact location, so he
let Stiles out of the car outside Risley
Hall.

"I wasn't sure where the house was,
so I walked up to a building on the right
up the little hill by Risley," Stiles said. "I
didn't know it at the time, but that hap-
pened to be the Risley annex—the girls'
dormitory. A young woman answered
the door, and I asked her about the
location of the fraternity. She didn't
know, so she called upstairs; and all of
a sudden, eight or nine girls came
down. That was some experience. After
all, I was a really shy boy from the
country!"

The women directed him to the
fraternity's house. Stiles arrived at the
fraternity, and met Earl Branch, one of
the brothers. Stiles ate a late dinner at
the house and stayed the night at the
fraternity. "One of the brothers even
gave me advice on registration and on
certain courses the next day," Stiles
said.

Stiles achieved a successful academic
career as a major in agriculture. He
became a member of Theta Kappa Nu
fraternity, which, according to Stiles,
later merged with and took on the
name of Lambda Chi Alpha fraternity.
"One interesting note—I was also on
the business board of the Countryman
from sophomore year through senior
year," Stiles said. "We used to canvass
places in Collegetown and in downtown
Ithaca for advertising in the
Countryman."

After graduating in January, 1934,
Stiles worked as a teacher and then for
Agway, which at that time was a farm-
er's cooperative, Grange League Fed-
egation. The company later offered him
the chance to spearhead the formation
of a subsidiary—a supermarket chain.
"That was in the 1940s, so supermarkets
were still starting up in places, and
I helped establish the P&C (which stands
for Producers and Consumers)
supermarket chain," Stiles said proudly.
Stiles worked in various cities in upstate
New York at P&C supermarkets in
various roles, such as store manager and
personnel supervisor/labor negotiator,
from 1947 until 1974, when he retired.

Stiles and his wife, Mary Seaman
Stiles '34, have lived in Syracuse for the
past 37 years. "My work just happened
to let us stay close to Cornell and
Ithaca," Stiles said. "We even lived in
Ithaca for about a year, when the head
office was located there. I guess with a
start like that at Cornell, I could never
end up too far away from it!"

by Betty Ng '91
PICTURE THIS: ITHACA, NEW YORK, 1920. You are an aggie walking peacefully around campus. Then suddenly, out of nowhere you hear this annoying yell, “Cornell, I yell, yell, yell, Cornell.” Then a long, loud “Moo,” a slight pause and finally three slow claps of the cupped hands: Flop, Flop, Flop. . . . What would you do? You would simply walk away with dignity and lots of boiling anger inside.

In the 1900s that was the usual response to “the cow college yell.” CALS was called the cow college during the early years of the University. In fact, there almost wasn’t a College of Agriculture and Life Sciences at Cornell University.

In 1862, the federal government introduced the Morrill Act, which provided a share of one million acres of land to any college provided that the institution made the teaching of agriculture an integral part of its curriculum. State Senator Ezra Cornell, a wealthy man with dreams of educating sons of farmers, decided to divide the money between the People’s College of Havana (New York) and the Agricultural College at Ovid (New York). But Senator Andrew Dickson White had his own vision of the type of university he wanted. After much discussion, Cornell went along with White’s idea, and a new solution to the Morrill Act problem was devised. Cornell proposed that he would endow $500,000 for a university in New York state if his institution were granted the benefits of the Morrill Act.

The state accepted Cornell’s plan and chartered the University. In October, 1867, with White as its first president, Cornell University opened its doors.

The requirement to provide agricultural education was not easy to follow. First, getting a qualified staff was difficult; there were few trained agriculturists in America. The first professor of agriculture lasted two years, leaving the position vacant for an entire year. Then Henry H. McCandless became head of the agriculture department but was quite unsuccessful. He was entirely unfamiliar with the methods of American farming.

Enrollment was another problem. The farmers were hesitant about the new idea of teaching agriculture at the University. Many feared that their children would forget the farm if they were given a college education. Others were simply too poor to send their sons to Cornell even when the tuition was free.

At one point, the University used tactics of desperation. Advertising for students was tried for a while. According to the Cornell University Board of Trustees Proceedings, the board passed a resolution that “every student who shall pursue the courses of agriculture shall have his tuition free during his course.” Board members had also discussed the idea of giving students free room and board.

Then came Isaac P. Roberts, who turned things around, thereby becoming the first successful professor of agriculture at Cornell. Roberts delivered lectures to the senior class and also took inventory of the Department of Agriculture, which showed six years of mismanagement. He immediately submitted a proposal for reorganization.

In 1891, at the end of Cornell President Adams’ administration, Cornell’s agricultural department had come a long way. But still there were severe obstacles for gaining support for a better program. Some trustees still had not seen the successful works of Roberts. Even when the number of agriculture students increased, some spoke of taking away funding, arguing that so much should not be spent for so few. And even if some farmers were successful in scientific agriculture, some were still unwilling to try. It was time for the state to own up to its responsibilities. Adams, in his last report, remarked that, “this is, in a very important sense, a state university.”

The university made a direct appeal to New York state farmers, but the same old argument of “where will the money come from?” persisted. That is, until Liberty Hyde Bailey came along.

Bailey persistently campaigned for a $250,000 building program and the establishment of the New York State College of Agriculture. By 1903, upon Dean Roberts’ retirement, enrollment was up to an astounding 247 students. Fifty applicants had to be turned away because of the lack of space. Classrooms, offices and laboratory space, as well as other facilities, were severely needed.

Approximately one year later, after a fierce fight, the bill was signed. The news reached Ithaca on May 9, 1904. According to Morris Bishop’s A History of Cornell, the fire siren blew; bonfires blazed; students filled the streets, firing pistols. Headed by a band and the College’s big black bull, they marched to Bailey’s home on Sage Place. Three days later, there was a formal parade, including a float with white-clad youths and maidens churning butter and another with students from twenty foreign countries. The College of Agriculture was finally and officially on its way while Bailey planned its reorganization.

by Wendy E. Austrie '91

The making of a college. The construction of the ag college during the early 1900s.
Roberts Hall: The unofficial gateway to the ag quad.

WHEN EZRA CORNELL FOUNDED Cornell, he had no possible way of knowing what his university would bring to the world. Seven undergraduate colleges, hundreds of majors, highly respected faculty and 18,000 intelligent men and women are the modern-day product of Ezra’s dream.

One of the most integral components of Ezra’s plan was the College of Agriculture and Life Sciences. The ag quad serves as the hub of the College, where thousands of students, professors and dogs daily cross paths on their way to class. The massive tan-colored brick buildings, forest-green colored grass and shapely trees make the ag quad the perfect place to relax or study.

The ag quad, like most of Cornell, has ties to the history books. Many Cornellians, though, fail to learn the fascinating history of the quad and its buildings. According to Education and Agriculture: A History of the New York State College of Agriculture at Cornell University, written by Gould P. Colman PhD ’60, the concept of the ag quad began in 1912 after the College’s administration failed to approve plans that would have enlarged Stone Hall. (Stone Hall, originally located at the corner of Tower Road and Garden Avenue, was torn down with the recent building of Kennedy and Roberts halls.)

The period between 1909 and 1913 was the busiest construction time in the College’s history. Bailey Hall, located at the northern end of the ag quad, was built during this early construction boom. Bailey Hall was named after Liberty Hyde Bailey, former dean of the ag college.

Kermit Caryle Parsons, in his book The Cornell Campus, discussed the relationship between Bailey and Andrew Dickson White, Cornell’s first president. Evidently, White in his diary described Bailey as having “an ambitious program of expansion for . . . the development of the agricultural science.” According to Parsons, the major expansion and academic innovations at Cornell in the decade after 1903 were the result of many of Bailey’s ideas and innovations. Bailey retired in 1913 from his post as dean of the College of Agriculture.

Caldwell Hall was built in 1915 in honor of Professor George Chapman Caldwell, the first faculty member selected by White for the College of Agriculture. Caldwell came to Cornell from the University of Pennsylvania, receiving his education at Harvard and at Gottingen University in Germany. As soon as he arrived at Cornell, White appointed Caldwell to the position of professor of agricultural chemistry and gave him the duty of selecting additional faculty for the College. In 1896, Caldwell and fellow professors from the College began lecturing to groups of farmers in the Ithaca area. These informal lectures are now considered the beginning of extension work at Cornell. Caldwell was also an integral part of the establishment of Cornell’s experiment station in Ithaca.

Located next to Caldwell Hall is Warren Hall, built in 1932 and named for George F. Warren. Warren was the first head of the Department of Agricultural Economics. Warren came to Cornell as a graduate student and studied horticulture under Liberty Hyde Bailey. Warren also served as the first editor of the Cornell Countryman. According to Colman, in 1905, Warren got his PhD and then served as horticulturist at the New Jersey Experiment Station; in 1906 he returned to Cornell and in 1907 he became the first director of the Department of Farm Crops in the College. According to Colman, Warren had a talent for attracting graduate students to
study with him. In 1908 ten of the College’s 43 graduate students studied under Warren. Warren demanded the most from his graduate students. When they failed to perform up to his standards, as they did in 1910, he would punish them by giving them poor recommendations.

Warren was responsible for many strides the College made during the early 1900s. One of Warren’s biggest contributions was an agricultural survey of Tompkins County in 1907. Warren retired as head of his department in 1938.

Next to Warren Hall is Mann Library, named after Albert R. Mann, who served as a faculty member and as director of the College. Colman wrote that Mann first entered Cornell in 1901 and graduated in 1904. After graduation, Mann spent a year at the Farm School for Destitute Boys in Boston, Massachusetts.

In 1905, according to Colman, Bailey convinced Mann to come back to Ithaca and help him prepare the *Cyclopedia of American Agriculture*. In 1908, Mann was appointed to the post of assistant professor of dairy industry. Mann then took a leave from Cornell for five months, returning in 1909 to serve as secretary to Bailey.

Colman wrote that in 1910, Mann was appointed professor of agricultural editing. Mann had been the editor of the College’s publications since 1906, so this new position involved no additional duties for him. In addition to serving in these various areas, Mann had an interest in extension programs with the rural communities surrounding Ithaca.

Now located at the northwest end of the quad, next to Kennedy Hall, is Roberts Hall. Roberts Hall was named after Isaac P. Roberts, who first came to the College in 1868 from Iowa Agricultural College. Colman wrote that Roberts had an extensive knowledge of the agricultural industry, which he had accumulated from farming in New York and Iowa, and from conversations he had with farmers and agriculture professors.

Roberts came to Cornell without a college degree. We learn from Colman that the president of Iowa Agricultural College knew Roberts’ lack of a college degree would be a strike against him in his relations with the faculty and students of Cornell. In an attempt to alleviate some of the anticipated tension, he persuaded the Iowa Agricultural College to deem Roberts an honorary Master of Agriculture.

While at Cornell Roberts accomplished many things, the most important being the overall organization and setup of the College. Roberts played a key role in the College’s relationship with surrounding agricultural communities through his position at Cornell and his position in the Ithaca Farmers’ Club. Two afternoons a week, Roberts would take students to visit neighborhood farms where they could get a hands-on feeling for how a farm operated. Roberts also took care of White’s horses and cow and also began the development of a Holstein herd, during a time when there were very few Holstein cows in the United States.

In the future more buildings will be added to the ag quad, while others will be torn down. Some gardens will be expanded, while others will be removed. The ag quad, though, will always be a great place to lie in the grass on a sunny afternoon.

by Kathryn Lancioni '92
Commemorating Kennedy

ASKED WHAT HE HOPE THE NEW Roberts and Kennedy halls would contribute to the College of Agriculture and Life Sciences, W. Keith Kennedy PhD '47 leaned back in his chair, touched his chin thoughtfully and chuckled, “Oh that’s a good one. You should ask Dean Call.” Kennedy, after whom Kennedy Hall is named, sat there dressed in a navy blue suit and a peaceful smile. His white hair hinted of his age but the spark of energy in his eye said it would be an exciting interview. That was an understatement.

Kennedy was particularly pleased that several departments in the College are now in one building. “This is more efficient,” he said; “it builds good working relations and improves coordination of activities.” He added that the improved facilities enable the departments to teach, advise and administer more effectively.

Construction of the $19.8 million Roberts and Kennedy halls was funded by the State University Construction Fund, Cornell Dining and alumni and friends of CALS. Ground was broken on March 26, 1987, and the buildings were completed on December 15, 1989.

Roberts Hall houses the CALS administrative offices, as well as Cornell Cooperative Extension. Kennedy Hall provides the new quarters for the Department of Communication and the Department of Education. It also houses Alumni Auditorium and Trillium, one of the largest dining facilities on campus.

Why was the new building named after Isaac P. Roberts and W. Keith Kennedy? “We wanted to pay tribute to Isaac Roberts, a man who helped found the College of Agriculture and establish a reputation of excellence,” said William Boldt, assistant dean of public affairs. “Kennedy’s leadership guided us to the present,” said Boldt. He added that Kennedy made the focus of the College more international in scope and helped diversify it to meet the changing needs of society.

According to the program from the building’s dedication ceremony, Kennedy received an MS from Cornell in 1941 and after serving in the United States Army for four years, received his PhD from Cornell in 1947. He joined the faculty of Washington State College for two years and then came back to Cornell as a professor of agronomy in 1949.

By the end of the 1950s, Kennedy achieved international recognition for his research in forage crop production, preservation and use. He was appointed to many positions at Cornell over the next 35 years: director of the Cornell Agricultural Experiment Station (1959), associate dean of the College of Agriculture (1965), vice-provost of the University (1967), dean of the newly named College of Agriculture and Life Sciences (1972) and university provost in 1978 to his retirement in 1984. At that time he was elected both professor emeritus and provost emeritus. Today, Kennedy is active doing volunteer and community work.

Asked how he felt about the naming of the building after himself, Kennedy replied, “I can’t imagine any greater honor and am most grateful; but I also realize that my accomplishments as an administrator came from the support of the University administration, faculty, students, staff and alumni.”

Kennedy was pleased when Cornell, through financial support from the state legislature, attracted the renowned Boyce Thompson Institute, a plant research organization employing some of the finest scientists and personnel.

In closing, Kennedy leaned forward, clasped his hands together on his lap and said, “I first arrived in Ithaca 50 years ago this past February. Aside from four years in the army and two years at Washington State College, my entire professional career was spent at Cornell University. And I think it’s the greatest educational institution in the world. I’m not saying this because I’m biased; but it’s a great university, and I consider myself fortunate to spend all those years at Cornell.”

by Christina Yee ’92
Robert Plane, professor emeritus of Cornell, has retired after several decades in the university’s service. 

**IMAGINE A VAST BACKGROUND IN chemistry and great interest in and love for nature. In Robert Allen Plane’s case, these two factors resulted in a lovely winery on Cayuga Lake, close to Cornell, where he spent more than 20 years as a professor, provost and researcher.** Now Plane has sold the winery, but his interest in nature and chemistry is still avid.

Plane almost looked embarrassed when faced with his many merits. He got a BA from his childhood’s local Evansville (Indiana) College in 1948 and his MS and PhD in chemistry from University of Chicago. He has also received honorary degrees from several institutions.

Cornell University has played a big part in Plane’s career. “I gave a guest lecture at the University as a graduate student, and they must have liked it,” said Plane, “because they called me up at Oak Ridge National Lab where I was working and asked if I could take a teaching position for just a year, as a faculty member had passed away. I stayed for 22 years.” This was in 1952.

Plane started out as an instructor in the Department of Chemistry. He went on to become professor and chair of the department before being named provost of the University. He remained provost until he moved on to Clarkson College of Technology as president and professor of chemistry in 1974.

While at Cornell, Plane’s life took a turn. The reason for the turn was Mary Moore, program director of Willard Straight Hall. “The students involved in the different programs were having a Christmas party at the Toboggan Lodge near Beebe Lake, and each student could invite their favorite professor,” Plane said with a smile on his face. He happened to be someone’s favorite and thus met his present wife in 1963.

Eventually, the Planes bought a 200-acre property with a 2,000-foot lakefront, because they were interested in sailing. However, they did not know what to do with the farmland. “First we tried kidney beans,” said Plane, “but we failed miserably. The following year we tried Christmas trees, but that was a failure as well. Then we tried birdsfoot trefoil, a kind of legume, but we never got a crop.”

At that stage, some agricultural economists suggested Plane plant grapes. “If we’re going to fail at something, we thought, we might as well fail at something fun, and we like wine, so in 1972 we planted grapes,” Plane said. After a few years selling grapes to the Taylor Wine Company, the Planes built their own winery. “In 1980 we produced our first wine, 400 cases; and now in 1990, we have produced 9,000,” Plane said.

Plane’s Cornell career did not end when he left the University in 1974. He started working at the New York State Agricultural Experiment Station at Geneva in 1986 and retired as director of the experiment station in the summer of 1990. He is still a busy man, though.

“I’m working on three different projects,” said Plane with enthusiasm. “First, I’ll have to organize the running of the 150 acres of land that we still have!”

Second, Plane will edit a newsletter for the New York State Horticulture Society. “The publication already exists, but it needs some new blood,” said Plane, who is already co-author of the textbook Chemistry, one of the freshman chemistry course books at Cornell.

“Third and last, I was just asked to join the Skilled Workers’ Emeritus Program,” Plane said with excitement. This is a program aimed at getting young people in high school and college interested in sciences and agriculture. This is perfect job for Plane: “What I have enjoyed the most in my career is teaching,” Plane reminisced. “Helping somebody to see something for the first time, whether it is regarding a lecture or a problem set, is a real thrill. I like working with young people.”

Plane wants to remain in Seneca County, close to Geneva, Cornell, Cayuga Lake and his old winery. “I’m not planning on moving anywhere, but anything can happen,” said the very charming Cornell veteran.

Love for nature and chemistry resulted in Plane’s winery on Cayuga Lake.
FOR THOUSANDS OF YEARS, NATIVE Americans lived on land that now houses such places as Cornell University, Ithaca College and the Ithaca Commons. Descendants of the Cayuga nation, along with other Iroquois nations, are now going to court in an effort to reclaim land or compensation for their losses.

"Indian land claims are, by and large, the backwash of a great national experiment in dictatorship and racial extermination," said William T. Hagan, SUNY distinguished professor of history, in Iroquois Land Claims.

He said that about 90 percent of the United States was gained by treaties which were often "not true bargaining sessions between equals." Military force, bribery, miscommunication and cultural misunderstanding were often the methods used by the United States government.

The Oneida land claim demonstrates some of the issues involved in Iroquois land claims. The Iroquois, or Haudenosaunee (People of the Longhouse), are comprised of the Mohawks, the Oneidas, the Onondagas, the Cayugas, the Senecas and the Tuscaroras.

The original home of the Oneida nation covered about six million acres in what is now New York, Pennsylvania and Canada. This land base was recognized by the government in the Treaty of Fort Stanwix, after the Oneidas' alliance with the United States during the American Revolution.

According to the Washington Newsletter of the Friends Committee on Nation Legislation, "between 1785 and 1788, the state [New York] 'negotiated' the Oneidas out of 95 percent of their lands."

In 1790, the federal government passed the Indian Trade and Intercourse Act. A section of this, better known as the Non-Intercourse Act, stated that no land could be acquired from a tribe without the consent of the United States government.

Several of the Iroquois land claims are based on the fact that New York state did not obey the Non-Intercourse Act and proceeded to negotiate for native American lands without the federal government's permission. As a result, the Oneidas lost about 300,000 acres in 27 transactions. "All of these transactions save two were concluded without the consent or approval of the federal government," said Arlinda F. Locklear, directing attorney for the Native American Rights Fund, in Iroquois Land Claims. The federal government, although aware of these illegal transactions, did nothing.

Then in 1970, the Oneidas challenged the legality of these transactions by suing New York state. Finally, in March, 1985, the United States Supreme Court ruled 5-4 that the Oneidas had the right to bring suit against New York state. Negotiations continue to this day.

The Oneidas, like other Iroquois nations, have said that they do not intend to reclaim all of the land that was once theirs. Private landowners in the northeast are not in jeopardy of losing their land. "The non-Indian public's fears of losing their land is totally unfounded," because native Americans in the northeast have clearly said that they are going after two things: one, monetary compensation; and two, land that is under
the public domain," said Cornell lecturer Robert W. Venables.

Public lands include both state and federal holdings. The amount of land that the Oneidas are asking for, said Venables, "could easily be taken care of by a state park."

He used the analogy that though a herd of cattle was taken, "the Oneidas are only asking for one back." Venables stressed that in comparison to the size of their original land base (six million acres), the Oneidas are asking for only a small amount of land back.

Following New York state procedures, native American lawsuits seek full compensation for all lands regardless of whether this is sought. New York state requires participants in a lawsuit to bring a claim to all the land illegally taken, whether publicly or privately owned now. "It's the rules that the white people set up themselves," said Venables.

Native American historians and leaders gathered at the Cayuga Nature Center from September 28-30, 1990, to share experiences and knowledge regarding land claims with college students from the northeast. The gathering, entitled "Iroquois Lands: Generation to Generation," was attended by over 100 people and 18 speakers.

The College of Agriculture and Life Sciences' American Indian Program (AIP), along with the Cayuga Natural Resources Project and the Native American SUNY Western Consortium, sponsored the three-day event, which featured both academic and social opportunities.

Each of the speakers represented a particular tribe or spoke on issues affecting land claims. Speakers came from as far as Maine and Massachusetts. Ron La France, acting director of the American Indian Program, and Jose Barreiro, editor of *Northeast Indian Quarterly*, spoke at the conference.

Venables presented a lecture entitled "New Research on an Old Concept: Haudenosaunee (Iroquois) Sovereignty in a Historical Perspective." Native American tribes, as sovereign nations, are legally "a foreign country, an independent entity," he said. But "the claim of sovereignty causes a great deal of friction" between United States governments and native American nations. Venables said that the two governments should negotiate as equals, such as when the United States negotiates with Canada.

The purpose of the conference was "to bring together experienced land claims negotiators and leaders with the up and coming generation of leaders," said Jameson Brant, coordinator of the conference. Emphasis was placed on "the transfer of experience from one generation to the next."

Native American students at Cornell and those in other SUNY schools were invited to the gathering. "It's for the benefit of the students," said Brant; "we want them to get together to discuss what their intentions or hopes are in regards to career development."

It was a "serious purpose in a social setting," said Venables. "We're setting up an agenda so that the students will know what the AIP staff is working on here at Cornell."

Students got the opportunity to question experienced people and role models and "to see exactly who our leaders are," said Brant. "We're in the process of creating a network for students," said Brant, "and to make people more aware of the issues."

People will get a chance to learn more about native American issues with upcoming events. A second conference, entitled "American Indian Contributions to Environmental Traditions," is scheduled for March 29-30, 1991.

Future plans include native American responses to the celebrations of the 500th anniversary of the arrival of Columbus. "All of the connections we make here [at the September conference] will get information on the 1992 conference," said Brant. The American Indian Program has surveyed native Americans throughout the continent for two years and has compiled its findings in the Fall, 1990 issue of the *Northeast Indian Quarterly.*

by Karen E. Clements '92
CHARLES DARWIN AND EZRA CORNELL had more in common than one might imagine. While Darwin was building the foundation for his theory of evolution in the second half of the 19th century, Cornell was busy laying foundations of a different sort.

The coincidence of timing between the University's beginnings and the controversial new theories inspired by Darwin set the tone for the way the University would approach the teaching of science for the next 125 years.

Although Cornell was not the first non-sectarian university, its bold new approach to scientific teaching brought it into prominent view. Preachers across the country claimed Cornell was a 'godless' university—a notion that both Cornell and Andrew Dickson White spent years trying to refute.

In the beginning, Cornell was both praised and condemned for its "liberal" environment and equally open-minded teaching practices. According to Bishop's A History of Cornell, the University was highly criticized at its inception for its willingness to accept and teach new scientific theories, especially the revolutionary concepts of mutation and natural selection as proposed by Darwin. Although Cornell hoped the University would adhere to basic Christian principles, he also wanted it to be non-sectarian so as not to interfere with teaching methods.

Cornell wasn't alone in his teaching philosophy. Louis Agassiz, a renowned Harvard naturalist and early champion of natural history, agreed that a teacher's personal beliefs should not get in the way of the facts he taught. At the University's inauguration in 1868, Agassiz said, "The professor of chemistry is not asked what creed he is, but whether he is a good chemist." Similarly, Agassiz said, a professor of anatomy or student of natural science should not have to define his secular views.

Agassiz caused a stir among the clergy when he gave 20 guest lectures at Cornell on the state of natural science. White, in his autobiography, said that large numbers of the country's brightest young men left Agassiz's lectures inspired to pursue the study of natural science.

Agassiz was denounced by church leaders for preaching Darwinism and encouraging atheism, thus intensifying Cornell's reputation for "godlessness." Reacting to the clergy's harsh words, a group of students formed the controversial Infidel Society, of which God, they joked, was not allowed to be a member.

Although it was years before a course at Cornell included the word "evolution" in its title, its major themes were discussed from the outset. Cornell had one of the country's only veterinary schools, and "comparative physiology" was included in the curriculum in the late 1890s.

The addition of the agriculture school also initiated further scientific study, making it impossible to ignore new scientific evidence. The College's course catalogs in the early 1900s included the words "natural selection" and "adaptation" in descriptions of its general biology course. So while the debate about whether to teach evolution in public schools raged on in the years surrounding the famed Scopes Monkey trial, Cornell had already been teaching evolutionary principles for more than 25 years.

While courses dealing with evolutionary biology have gradually been added to the curriculum over the years, a new type of course was introduced a few years ago by Professor William Provine. The course, Evolution, is crosslisted with history and is intended primarily for non-science majors. It deals in large part with the philosophical questions about the origin of life, and Provine's strong evolutionary views often stir intense debate among students in their discussion sections.

Though students may become frustrated by the seemingly unanswerable questions presented in the course, most will admit it makes them think of things they really had not considered before. And most will admit it is challenging to explore the basic questions raised by Charles Darwin over 100 years ago. Thanks to the University's early stance on the teaching of science, Cornellians have been able to explore those questions from the start.

by Joann M. Pezzano '92
WHAT DO THE LETTERS "W.S.G.A." bring to mind? Nothing? A lot? If they conjure up thoughts of dormitory curfews, sign-in-slips, dress codes and penalties for minutes late, then you've probably been a Cornell alumna, or "co-ed," for at least 20 years.

The Cornell Women's Self-Government Association, or the W.S.G.A., as it was commonly known, regulated several aspects of a Cornell woman's life, including social. Men, of course, were not subject to the same restrictions.

"There are two ways to look at the W.S.G.A.," said Jennie Farley '54, MS '69, PhD '70, editor of several books on women's studies and now a professor in the ILR School as well as a faculty representative on the Board of Trustees. "One way is to see it as oppressive," said Farley. In other words, the rules were very strict. "If we missed our 10:30 p.m. curfew, we received minutes; one minute for every minute we were late. If we got too many (about 15 for the week), we could be grounded for a Friday or Saturday night." These nights were usually the nights that co-eds chose to take the two or three "late nights out" they were allowed per week. To go on a late night out, all women had to sign out by 10:30 p.m., and they had to list a specific destination.

Other rules had to do with what Farley called gracious living. "They were supposed to teach us good manners," she explained. As a result, social behavior in the dorm dining halls, where women were required to eat, was regulated. A freshman deskbook for the class of 1950 explained that women "must not stop at tables to talk on the way out of the dining room or call from table to table."

But like all rules, the W.S.G.A.'s were broken. When asked if she ever broke the rules, Farley laughed and said, "We all did." Smiling at an old memory, she added, "It was hard. You and your boyfriend would be having this serious conversation outside Balch when they'd start to flick the lights on and off just before 10:30 p.m. to warn us that curfew was coming. You wouldn't know what to do—sometimes you'd decide to keep talking (or hugging, as she later admitted) anyway."

When a woman did break the rules and got caught, she would unquestionably be punished. W.S.G.A. Judicial Committee records from February, 1917, outlined some penalties. For instance, two women were grounded for six weeks because they lied about where they were going. Instead of going to the theater, which was all right, they went sleigh riding, which was not. A third girl, a senior who had convinced them to go and who had organized the ride, lost her senior privileges until graduation.

While Cornellians may have disliked and broken the rules, often these same women felt pride for the W.S.G.A. In a scrapbook belonging to Grace Corwin '21, a letter from Edith Ausmer '19, Corwin's "grandmother," or student advisor, reads, "We are all proud of our student government. The girls make their own rules and enforce them through the executive and judiciary committee."

This pride points to the second view that Farley mentioned could be taken about the W.S.G.A.—that it was very progressive. "At other schools house-mothers would make the rules. At least at Cornell the women themselves made the rules. And they started pushing very hard to relax them; they started pushing for treating women more like men," Farley said.

And in some ways, the rules were eventually relaxed. By 1964, juniors and seniors no longer had curfews. And in 1968, the W.S.G.A., along with its rules, ceased to exist.

The fact that the women themselves made the rules leads to an important point. The rules seemed appropriate; they were, for the most part, taken for granted. "You never thought twice about it," said Virginia Briggs '35. "No—body resented the rules; it was just like going to class."

But while rules regarding curfews were taken for granted or as a sign of the times, others were often seen as just plain ridiculous. "The most annoying rule was that we couldn't wear shorts on campus without a raincoat to cover ourselves," said Martha Adler '53, DVM '56. "So it'd be a beautiful day out, 80 degrees, and you'd be wearing this raincoat to the tennis courts and back."

Despite all the rules, which seemed very Mickey Mouse to us at the time," said Farley, "it was a happy life."

Adler agreed. "It was a nice time to go to Cornell," she said. "Although the rules were a nuisance, they really didn't stop us from doing what we had to do or what was important. We learned to work with the system. Actually," she concluded, "it was a little like having a mother."
FOR MOST PEOPLE, THE FAMILY dog is just a pet, waiting patiently in the background for an occasional walk, a biscuit or an ear scratch. For Mary Jean Wylie, assistant professor in the Department of Animal Science, Louise Parke-Dabes ’92 and doctoral candidate Drew Arnold, dogs are a focal point of their lives.

Wylie's eight dogs are highly trained athletes competing in the top echelon of obedience trials. Parke-Dabes breeds and shows nine Gordon setters, while Arnold uses his two skilled border collies to herd sheep.

"It's important to use the dog for what it's bred for," said Wylie, whose "star," Gillian Gish Grenfell, a yellow Labrador retriever, has earned two hunting dog titles as well as five obedience titles. Parke-Dabes agrees; her Gordon setters, although primarily show dogs, are also trained and tested for hunting ability. And no one endorses this philosophy more heartily than Arnold—border collies have been bred for herding sheep in Scotland for hundreds of years.

Jorma and Cap helped Arnold handle 400 to 500 sheep at the University of Minnesota, where he was a shepherd before coming to Cornell to study hormone interactions in livestock.

"Some people say a dog is worth two or three people. I think it's more like four or five," Arnold commented as he watched his two wiry, black-and-white dogs swiftly herd a nervous flock of Cornell sheep toward him.

The logistics of owning, caring for and training these talented companions are not always easy. All three owners have kennels or fenced yards, where the dogs can exercise safely without supervision. Arnold, his wife and young daughter had to travel 25 miles from the Cornell campus to find a home suitable for the border collies and the two other dogs they own.

Parke-Dabes gets up at 6:00 a.m. to exercise and feed her dogs. She also takes them on four-mile-long hikes up Mount Pleasant every day.

"It helps to keep me in shape. Dogs don't want to hear excuses—you go every day, in all kinds of weather," she said. Parke-Dabes, a communication major, combines student, wife and dog-owner responsibilities by making lists and keeping to a tight schedule.

Wylie, on the other hand, said her dogs have to be (and are) adaptable to a somewhat eclectic schedule.

Despite the cramped timetable, Wylie does try to do some training each day. And that training has paid off. Her dogs have earned high scores in obedience competition, including the rare and coveted "200"—the highest score possible, a perfect performance. Obedience exercises include retrieving over a high jump, heeling by the owner's side, responding to hand signals and singling out an article with the owner's scent on it from a group of several iden-
tactical items.
In the conformation ring, where Parke-Dabes exhibits her setters, dogs are judged on how well they stack up to the ideal of form, gait and temperament for their breed. According to the Gordon Setter Club of America, the ideal dog should be "good-sized, sturdy, built well-muscled with plenty of bone and substance but active, upstanding, and stylish... His bearing is intelligent, noble and dignified." The rich black-and-tan coat is to be "soft and shining" with feathering on the legs and tail. Two of Park-Dabes's dogs have won championships, and several more have earned points toward championships.

Parke-Dabes breeds for temperament as well as looks, and it is with satisfaction that she sees some of her first Gordon's qualities in the pups she now has. "They possess a certain spirit that she had and heart that a dog has to have in the ring and the field," she said.

Arnold, too, has tried his hand at competition. He stopped participating in sheep dog trials when he found that his dogs, trained to work sheep on the open range, were frustrated by the small paddocks. In a recent demonstration, he displayed Jorma and Cap's dazzling speed and responsiveness. "Way to me" commands the dog to circle the sheep in a counter-clockwise direction. At the "come by" command, a dog makes a clockwise outrun, hooking around behind a group of sheep and moving them toward the handler. If the sheep panic and start to move too fast, a single "lie down" instantly flattens the collie to the ground, calming the sheep. The dogs must be able to read the flock's mood, respond to the handler and think for themselves, all at the same time.

"You want to preserve that ability," said Arnold, "They are the easiest dogs to train because of their intelligence." Intelligence is evident in Wylie's dogs, too. Wylie, who spends 60 percent of her professional time developing Cornell Cooperative Extension 4-H programs, uses her dogs for teaching kids about animal care and behavior. She often brings Marcy, an American Staffordshire terrier, along to demonstrations where 4-H-ers practice taking the dog's temperature. The task must be something of a challenge because Marcy's tail, indeed the entire rear half of her body, never stops wagging. Marcy is also registered as an American Pit Bull terrier, her gentle, friendly nature dispelling popular notions about bad temperaments in this breed.

All three owners emphasize that their dogs are, above all, much-loved companions. As Parke-Dabes said, "They give unconditional love, and they're wonderful company." And that, after all, is what all dogs—family pets to canine superstars—do best.

by Elaine Bloom '91
"[Germans] are the happiest people in the world," shouted West Berlin mayor Walter Momper on November 9, 1989, as tens of thousands of East Germans flocked to the West to celebrate the opening of the Berlin Wall. I couldn't believe what was happening as I watched the news report. No one could. The East German government shocked the entire world last November by allowing its citizens to freely travel to the West. Suddenly, talk of unification filled the airwaves, subways, classrooms, and even dentists' waiting rooms. A new excitement erupted throughout Germany for the first time in over 40 years. German unification seemed inevitable.

I was fortunate enough to spend the past year in Germany as an exchange student and experience this excitement. I was also able to observe the many problems caused by German unification. Although Germany has been officially unified since October 3, many of the problems accompanying the process have remained.

Since November 9, 1989, former East Germans have fled by the thousands to the West, creating housing shortages, overcrowding in subways and posing a threat to social benefits in the West. Stephan Schad '91, an agricultural economics major from Germany, said that many Germans from the West are hostile toward "Ossies," or former East Germans. Much of the youth from the West feel that their future social benefits are being taken away to support the depressed economy of eastern Germany and to support "Ossies" living in the West, added Schad. "To teach the youth not to be hostile will be difficult if not impossible," Schad said.

West Berlin has become especially tense due to the overcrowding problem. Shopping in Berlin requires patience and finding a seat on the U-bahn (subway) requires luck. I remember seeing East Germans camped out in front of supermarkets at three in the morning, waiting for opening time to avoid long lines the next day.

Unification has also created enormous problems for eastern Germans. The East German currency was converted into West German marks during the July 1, 1990, currency reform. Prices skyrocketed in the East after July 1, as eastern markets were flooded with products from the West also selling at prices from the West, according to Gesa M. Valk '72, a German from the Department of Modern Languages and Linguistics. "People earn the same salary as before, but now everything costs three times as much. People have to dig into their savings just for basic staples," said Valk after her visit to Germany this past summer.

East German stores were always cheap compared to the West. But on my way to Berlin during a visit after the currency reform, I went into a shop in eastern Germany to buy a snack. The prices were outrageous. Items were even more expensive than in the West.

Unemployment is another big problem. Factories in East Germany had often employed more workers than were needed, due to an East German law which guaranteed every citizen a job. This law no longer exists and now people are being discharged. "I went to the East to visit my publisher," said Valk, "and half of the staff had lost their jobs."

Those who are still employed need to be retrained. West German laws now apply to eastern Germany too. Lawyers in the East have to learn West German law and police officers will need retraining. Teachers and professors will first have to be reeducated themselves before they begin to educate eastern German youth with a western curriculum.

"To achieve an equal standard of living with the western part of Germany, former East Germans will have to wait five to ten years. That is only an estimated guess," said Valk. Schools need new books. Factories are old and outdated and will have to be modernized. A short walk over the Brandenburg Gate into East Berlin reveals the contrast between East and West beyond a doubt and clearly demonstrates the need to modernize eastern Germany.

This modernization of eastern Germany will be costly and will greatly affect the economy in the short run. Many believe, however, that economically, unification will only prosper Germany in the long run. "Although there will be problems right now, West Germany has to invest in the East. If you look over 10 to 15 years, or 20 years, this will only increase the German economy," said Martin Ganal, a research associate from Germany in the Department of Plant Breeding and Biometry. Schad agreed, adding, "It is easier to pump up an inefficient system than to build up a completely new marketing system. East German products are already known as good products [in eastern Europe]."

Fall, 1989 was indeed a time to celebrate in Germany, but now it is time to get down to business. Germany is officially unified, but the work has only just begun. Most Germans seem to believe that unification will benefit Germany in the long run. This may be true, but it is time for Germans to buckle down and prepare for difficult times if they want to reap the benefits that unification promises for the future.

by Chris McManus '91
No Small Potatoes

John S. Niederhauser ’39 was named the 1990 recipient of the World Food prize for his achievements towards development of a blight-resistant potato variety. Niederhauser, who has been dubbed “Mr. Potato” by his colleagues the world over, was a member of the faculty of the College of Agriculture and Life Sciences until he left Cornell in 1948 to work with the Mexico-Rockefeller Foundation Agricultural Program. His discoveries have had a dramatic impact on the food-deficient regions of the world and have helped make the potato one of Mexico’s primary crops today.

Administrative Changes at Geneva Station

Three members of the Geneva Agricultural Experiment Station were promoted to associate professor over the summer. Terence L. Robinson, associate professor of horticulture, is responsible for research on cultural aspects of tree fruits such as trickle irrigation, tree spacing, canopy design, and tree trellising. Timothy J. Dennehy, associate professor of entomology, is researching insects that attack vineyards in New York and is helping to develop integrated approaches to their control. Dr. Wayne F. Wilcox, associate professor of plant pathology, is statewide leader for extension programs on the management and control of fruit diseases, and his research emphasizes the biology and control of economically important diseases of tree and small fruit crops, especially soil-borne diseases.

From Bees to the BBC

The Bee Team, a BBC nature film based on the research of Stephen T. Emlen and Peter H. Wrege, won first prize for commercial productions at the Seventh Annual Film Festival of the Animal Behavior Society. Emlen, a professor of neurobiology and behavior at Cornell, and Wrege, a research assistant in the section, explored the social systems of animals that display selfless behavior, including a variety of birds called white-fronted bee-eaters. The film was shot in Kenya’s Lake Nakuru National Park for the British Broadcasting Corporation and has been shown on PBS stations throughout the United States, Europe and Central America.

New Apple and Grape Named by Geneva Experiment Station

New varieties of apple and white wine grape were released by Cornell’s New York State Agricultural Experiment Station at Geneva on September 20, 1990. Created by a cross between the Haralson and McIntosh, the new Northern Lights apple is slightly tart and fruity, and was developed for home orchards in severely cold regions near the northern limits of apple growing. The new Chardonnay grape was developed by a cross between the Seyval and the Chardonnay grape and produces a high quality, delicate and lightly fruity wine. The grape is winter-hardy and is recommended for sites in New York and Michigan with longer than average growing seasons.

Robert B. Gravani, associate professor of food science, has been selected to receive a fellowship for the 1990 National Leadership Development Program from the National Center for Food and Agricultural Policy in Washington, D.C. The program involves a month-long intensive study of the inter-relationships between agricultural and related policies.

Robert A. Plane retired as director of the Geneva Agricultural Experiment Station on June 30. Plane had been director since November, 1986 and previously served as provost of Cornell. Succeeding him was Dr. James E. Hunter, professor of plant pathology and associate director of the Station. Hunter has been at the Geneva Station since 1972, during which time he served as chair of the Department of Plant Pathology for ten years, expanding departmental research interests and increasing the number of scientists studying fruit and vegetable disease matters.

Hugh C. Price was named chair of the Department of Horticultural Sciences at Cornell’s Agricultural Experiment Station at Geneva on July 1. Price comes to Geneva from Michigan State University, where he had been a professor of horticulture from 1971 until 1990 and had worked with every major vegetable crop grown in that state. He succeeds Robert L. Anderson, who now assumes responsibility for the Station’s stone fruit breeding program. Anderson was chair of the department from October, 1985.
NESTLED RIGHT IN THE MIDST OF Cornell University, where some of the most promising students in the world study subjects like engineering, entomology and economics, sits a barn. A big red barn.

Sure, Cornell has other barns. It must, in order to provide instruction in animal sciences and veterinary medicine. But this Big Red Barn, the one that lies between the Andrew Dickson White House and the Space Sciences Building, is something special. Like many other buildings on the Cornell campus, the Big Red Barn holds a history of its own.

The Big Red Barn is closed as a dining facility for now, but if a recent proposal is accepted by campus administrators, the Barn may soon serve another purpose at Cornell— as a graduate and professional student union.

Andrew Dickson White probably never guessed that his barn, built in 1874 to house his horses and carriage, would see so much activity throughout the decades.

According to University archives, the barn was used as a carriage house and then as an automobile garage until 1955. In that year, Cornell trustee Allan H. Treman '21 and a group of alumni raised enough money to refurbish the Barn. It was then used as a gathering place for returning alumni. The Barn's employees, called "farmers" and "farmerettes," would scurry about in plaid shirts and straw hats, serving "barn size" sandwiches following Big Red football games and other events.

By the late 1950s, the Big Red Barn acquired some interesting historical items. A Cornell Daily Sun article from 1962 reports that at that time the building contained old leather horse harnesses, an assortment of buggies, and a "cuckoo clock, formerly in the private rathskeller of Oscar of the Waldorf, a maitre d'hotel."

The Barn also housed a life-size papier maché horse hitched to an old carriage. According to the Sun article, the horse was made in Paris and before coming to Cornell had stood in a department store in Trumansburg, New York. Ronald Loomis, director of Cornell's Unions and Activities, said that the horse, nicknamed "Truman," was returned to Trumansburg to reside in a museum. The other historic items in the Barn were also moved, presumably into historic preservation.

In 1969, the Big Red Barn became part of Willard Straight Hall under the jurisdiction of Unions and Activities, and it continued to be used as a popular gathering place. Twelve years later, in 1981, the Big Red Barn began serving cash lunches, providing a much-needed dining facility in the central campus area. The Barn continued serving food until it closed in the winter of 1989.

Trillium's opening in the new Kennedy Hall made it less critical to have a food facility in the Barn. Loomis said the main reason for the Barn's closing was its need for extensive repairs. He said that practically everything in the Barn needs refurbishing, including windows, insulation, all utilities, and the structure itself.

Members of the Henry, the present graduate and professional student center on campus, hope to renovate the Big Red Barn and make it their new headquarters. Loomis said the goals of this plan are "to upgrade this historically significant and charming building and to create a facility unique to the needs of graduate and professional students."

If all goes well, within the next few years the Big Red Barn may once again open its big red doors.

Until then, one can only wait patiently outside the Big Red Barn, remembering its rustic smell and hoping that it will soon be filled once again with Cornellians in search of an on-campus oasis.

by Catherine G. Healy '92

New York State College of Agriculture and Life Sciences, a Statutory College of the State University, at Cornell University
Alberding Field House
see page 12
About the Issue

Like all new buildings, the C. Howard Alberding Field House marks beginnings and changes on the Cornell campus. From Alberding, to the re-opening of Cascadilla Gorge, to research for a tastier tomato, this issue of the Countryman explores recent developments at Cornell.

Not neglecting the past, this month’s Countryman also looks into the experience of the first black woman to graduate from the ag college. Also included is an environmental story, in tune with current local interest. Also of great concern is how Cornell proposes to help pay for all its plans; thus arises the story on Cornell’s aspirations to raise 1.25 billion dollars—the largest Ivy League fund drive in history.

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THE ONLY LIGHT IN THE DARKENED walk-in cage was a narrow beam from a flashlight. Wildlife rehabilitator Rose Borzik '85 held the flashlight in one hand and a gerbil in the other. The light fell upon a small owl perched on a branch. The screech owl had been found many months before, beside a road, the victim of a collision with a car. A kind man had picked him up and taken him to the Student Avian Clinic at Cornell University's College of Veterinary Medicine.

Founded in 1977, the clinic has two purposes, according to William J. Gould III DVM '76, the clinic's current faculty advisor. It exists both to treat ailing wild birds and to help educate students. In contrast to their classes, where students learn facts and techniques, the avian clinic provides the opportunity for students to learn what Gould calls the "art of veterinary medicine."

"They are learning to use the tools that are available, make diagnoses and prognoses; learning how to decide which tests to run. It's a combination of common sense and medical knowledge," added Gould.

The clinic, which treats about 500 birds every year, is run almost entirely by veterinary students. "Most of the decisions are made by students. We learn how to make decisions and have responsibility for cases more than at any other time during our four years here," said senior Eileen Manyin.

As seniors, students perform surgery on birds and advise juniors on treatment. Juniors are the "main movers and shakers," according to Gould. They run the clinic and oversee day-to-day care.

Juniors assist in surgery and make decisions and diagnoses. They also train the sophomores who will replace them as supervisors.

"It is almost exclusively students learning from other students," said Manyin.

The learning often does not come easily. Students are not paid for their work, nor do they earn credits. The hours are long and the result is sometimes heartbreaking.

Manyin will never forget the peregrine falcon (an endangered species) with a broken wing, that died after a month of treatment. Sometimes students must euthanize birds that are blind or permanently crippled. Despite the disappointments, though, Manyin retains her enthusiasm. Releasing a bird back into the wild is often a student's greatest thrill; Manyin calls it "unbelievable!"

Birds that are releasable usually need rehabilitation before they can be set free. This can be simple cage rest or it may include complicated physical therapy to strengthen an injured wing.

Songbirds ready for rehabilitation are sent to wildlife rehabilitators in the Finger Lakes area. Birds of prey, such as owls and hawks, need special facilities that most "rehabers" don't have. Fortunately for the birds, the Hawk Barn Rehabilitation Center associated with the Student Avian Clinic has the huge cages needed by birds of prey to regain their lost flying and hunting skills.

Many birds must practice flying at the end of a modified fishing line before they are strong enough for release. Young birds must be taught to hunt. Other birds, blind or permanently crippled, learn to sit quietly on a trainer's arm and assist in public wildlife education programs.

The Hawk Barn is run entirely by volunteers. The veterinary college contributes some funding because of the close association with the Student Avian Clinic. But Borzik, a licensed rehabilitator who helps run the clinic, has been known to reach deep into her own pocket for supplies or special foods. The three-dollar gerbil Borzik had purchased was just such a donation.

The little screech owl who sat on his perch at the center had recovered from many injuries. But he was blind in one eye and probably partially deaf—not a good condition for a bird of prey that hunts by keen sight and acute hearing. As Borzik placed the small live rodent in the darkened cage, she was offering the bird one last stab at life—and at freedom. Would he be able to find and catch his prey, as he would have to in the wild? If not, his fate was grim; Borzik might, if she searched long and hard, find him a home as an "education bird" at a nature center—otherwise, he faced euthanasia.

The owl sat very still on his perch. The gerbil scuffled among the dry leaves on the floor. A sudden, silent, swooping flight and the bird clasped his meal in his talons. Freedom was near.

by Elaine Bloom '91
An Option for Communities

WHEN JODY EARLE AND BRIAN EARLE ‘68 MPS ’71 bought their West Dryden home in 1972, they did so with the beliefs that the nearby landfill was going to close and that the Tompkins County Board of Representatives had pledged not to put a landfill in that community again. Their first belief was correct; the landfill closed in October 1985. Their second belief was incorrect.

When a new landfill was planned in Tompkins County in 1985, six of the 23 potential sites were within one and a half miles of the Earles’ home. “When they announced the sites, we had a meeting at the West Dryden community center and 200 residents showed up,” said Brian Earle, director of The Empire State Food and Agricultural Leadership Institute in the College of Agriculture and Life Sciences. “It went back to the fairness issue. The West Dryden area had done its share and now it was time for somebody else to take the burden.”

No community, whether or not it has previously hosted a landfill, wants a landfill or volunteers to host one. “The community selected to host the landfill feels it should not be required to carry the burden of long-term, unpredictable threats to the health and living conditions of its residents for the benefit of landfill users who live, work or do business elsewhere,” explained Lyle Raymond, water resources specialist at Cornell’s Center for Environmental Research, in his 1989 paper “Living with Landfills: Host Community Benefits.”

Raymond is one of New York state’s chief proponents of host-community benefits or benefit sharing, a measure that aims to reduce the burden on the host community. Through host-community benefits, outside communities that use a landfill share the benefits of use with the host community. They do this by supporting, through taxes or tipping fees, safeguards for the host community.

Typical safeguards include property value protection plans, potable water supply guarantees and restoration, improvement and preventive maintenance for roads and water bodies that may be adversely affected by the landfill. Raymond stressed that these benefits should not be offered as a bribe and that they do not eliminate host community opposition. “You offer the benefits on the basis of fairness,” he said.

Raymond stressed that these benefits should not be offered as a bribe and that they do not eliminate host community opposition. “You offer the benefits on the basis of equity and fairness,” he said.

Raymond said he sees citizen participation as vital to a successful program. This is achieved through a Citizens’ Advisory Committee. “The residents who feel that they are most affected by the presence of the landfill constitute a rather narrowly focused special interest group within the host municipality,” Raymond wrote in his 1989 paper. “A need exists for specific representation of the interests of this group within the political decision-making structure.”

The Citizens’ Advisory Committee is composed mainly of residents who live in the vicinity of the site or in the impact area. It is responsible for providing recommendations to the county government about the design and operation of the landfill and for assisting in the development of a host-community benefits program. A properly functioning Citizens’ Advisory Committee gives a community official recognition of its concerns and direct access to the decision-making level of the government agency developing the landfill, Raymond said.

Compensating host communities for undesirable land uses is not a new idea. It was considered in the 1960s and 1970s in relation to nuclear power plants and hazardous waste sites, for example. “What is new is applying it to municipal waste sites,” Raymond said.

Some form of compensation or risk mitigation for host communities is already required by law in New Jersey, Pennsylvania and Wisconsin. Several other communities across the country are investigating variations of the host-community benefits concept.

In New York state, Tompkins County is considered a leader in developing a comprehensive host-community benefits program. Raymond introduced the county to the concept in 1985. “Tompkins County was ripe, ready for something like this,” Raymond said.

County and town officials were...
Feeling DUM

receptive to the idea. Within two years, several towns, though still strongly opposed to hosting the proposed landfill, passed resolutions favoring a host-community benefits program as a contingency plan. In June 1987, the County Board of Representatives passed a resolution committing the county to a benefit sharing program.

Six months later a landfill site was selected in West Dryden, where the Earles live. The community was skeptical about the promises of a host-community benefits program. "A lot of people said it was great, but let's see if they really do it," said Nancy Ten Kate, a member of the Citizens' Advisory Committee.

To date, "they," the county, with considerable assistance from the West Dryden community, have done a great deal. Three separate citizens' committees have been established to protect the community's interests, and programs to protect the area water supply and property values are already in place.

Under the water protection plan, a potable water supply is guaranteed to anyone who can make reasonable proof that as a result of the landfill their water quality has been diminished.

Under the land value compensation plan, if an owner cannot sell his property for its price in a community without a landfill, the county will either pay the difference between the value and the sale cost or will buy the property. This protection extends to future as well as present property owners. "We probably have the best land value compensation package in the country," Earle said.

Both county officials and West Dryden residents seem pleased with the county's progress in developing a host-community benefits program. Daniel Winch, county board representative to the Citizens' Advisory Committee, admitted that he was skeptical about the program at first, but feels the committee has given the county exemplary input. "After working with this committee, I feel that we can negotiate a very fair plan, and I think that my feelings are representative of all the board," said Winch, a 29-year employee of the statutory colleges.

Committee members have equally high praise for the board. "The citizens' advisory group is really proud of the work that the Board of Representatives has done on the compensation issues and of their willingness to listen," Earle said.

Winch, Earle, Ten Kate and Charles Evans, former Citizens' Advisory Committee chair and current Board of Representatives member, all said they would recommend that other communities siting a landfill investigate a host-community benefits program. "My personal opinion is that it [Tompkins county's benefit sharing program] should be used as a model in other areas of the country," said Evans, technical advisor at Cornell Information Technologies.

No benefit sharing plan can guarantee a host community complete protection from the hazards posed by a local landfill. Host-community benefits do, however, allow host communities to minimize the inequities of, and maximize control over, a difficult situation.

by Marisa Rose Crissey '91
A Gift for Giving

by Joann M. Pezzano '92

BACK IN HER DAYS AS AN UNDER-
graduate, Kelly J. Smith ’88 did not shy
away from a challenge. As president of
Ag Ambassadors, an organization
which works to keep freshmen, transfers
and alumni in touch with the
College of Agriculture and Life
Sciences, Smith faced new challenges
every day. She quickly learned the art
of managing people, and her efforts
helped to bring students and alumni
closer together.

Smith’s dedication did not go unno-

iced. The CALS Alumni Association
presented her with its annual Senior
Service Award, given to one or two stu-
dents in recognition of their “outstand-
ing leadership and service” to both the
College and the University as a whole.
The award is a token of thanks—a gift
for students who spend so much of
their time giving to the ag college.

After graduation, Smith was looking
for yet another challenge, and the big
city beckoned. “For most of my class,
New York City was the place to go,” she
said. But after a year working for The
Prudential, Smith decided she needed
more marketing skills and headed back
to Cornell to pursue her M.B.A. That
was when another opportunity to serve
the ag college arose. When offered the
position of assistant director of the
CALS Alumni Association, Smith
jumped at the chance to work with the
very organization that had recognized
her as an undergraduate.

The CALS Alumni Association has
sponsored the Senior Service Award
yearly since 1977. On half of those oc-
casions, it has been awarded to two
seniors after the judges found it diffi-
cult to choose just one outstanding stu-
dent from each class.

Smith admits she was surprised
when her name, along with that of Ben-
jamin Davis ’88, was called at the senior
barbecue, where the winners are
presented with a plaque and a $100
check. Smith said although she may
have been successful as president of the
Ambassadors, she didn’t achieve what
she did by herself. “I really had a great
steering committee that year. The Am-
bassadors couldn’t have accomplished
what they did without it.”

Alexandra Murray Thomas ’89 was
one member of that “awesome” steering
committee. Thomas went on to win the
Senior Service Award the year after
Smith as a result of her dedication to a
variety of organizations. Thomas spent
time as secretary and later president of
both Ag Ambassadors and the equestri-
an team. She also did research and
learning for the ag college and worked
to choose students who have con-
tributed broadly to the College, al-
though the winners may be those who
have dedicated themselves to one par-
ticular organization.

Although they begin their search
looking for just one winner, the judges
said they would rather give two awards
than have to choose between students
who have contributed equally to Cor-
nel. That happened again in May 1989,
when the committee decided to ac-
knowledge the efforts of both Thomas
W. Cosgrove, Jr. ’89 and Joshua G.
Wright ’89, who both took home the
award.

The Senior Service Award is some-
ting many ag students are not aware
of, and administrators like it that way.
Both Alexandra Thomas and Kelly
Smith said they were not really expect-
ing such an award, and that may be an-
other indication that their motivations
for service were genuine. Asked why
she did it all, Smith smiled and said,
“It’s just that I love the ag college.”

Benjamin Davis ’88 and Kelly J. Smith ’88 both
received the CALS Alumni Association’s Annual
Student Service Award.
to be
The First . . .

IN 1862, IN HIS PLEA FOR MORE LAND to found his university, Andrew D. White wrote an eloquent letter to the Honorable Gerrit Smith stating carefully his plans for the University. His first and foremost concern was to “secure a place where the most highly prized instruction may be afforded to all regardless of sex or color.” He went on to explain that it would be a blessing to the “whole colored race and the whole female sex” if women and “colored persons” were admitted to a great university such as that of his dreams.

Twelve years later, in another letter in reference to the status of black students, White stated that he would accept any qualified student “even if all our five hundred white students were to ask for a dismissal on that account.”

In the fall of 1894, Sara Winifred Brown was offered placement in the Department of Agriculture of Cornell University, thereby becoming the first black woman in the University.

According to the University Archives, Brown, who was born in Winchester, Virginia, graduated with honors from the Hampton Institute, then went on to the Niner Normal School in Washington, D.C., again graduating with high academic honors.

Right after high school, Brown entered Cornell’s ag department to major in the sciences. There, she became a charter member of Juggale, a biology society in the department, and the Wayside and Aftermath Clubs, both literary societies in the University.

Although there is no explicit information about Brown’s personal life at Cornell, it is known that she did not live in Sage College, which was the only on-campus residence hall for women.

Three years later, Sara Winifred Brown graduated with her B.S. degree from the ag department. Upon graduation, she returned to Washington, D.C. to teach biology part-time at the local schools while attending the Howard University Medical School. She earned her M.D. degree there four years later.

A remarkable young black woman, Dr. Brown decided to practice and teach medicine in Washington, D.C. However, unable to quench her thirst for education, she later took a few years off to study sociology and anthropology at Columbia University in New York City.

In 1919, Dr. Brown returned to Washington, D.C. to lecture on hygiene under the Division of Education and Research of the National Board of the YW.C.A. As a lecturer, Dr. Brown traveled the country and lectured to women in the few universities for black students. Her hard work won her a position as alumna trustee at Howard University. She was the first woman ever to receive such an honor.

As a famous and knowledgeable black woman, a rarity in those days, Dr. Sara Winifred Brown attracted the attention of many social agencies. According to the University Archives, she was appointed by the Women’s War Work Council to be a member of the “flying squadron” of fifty women physicians. She became the medical officer to accompany the Gold Star War Mothers to France in 1930. Later on, Dr. Brown was appointed an official member of the American Red Cross.

In Washington, D.C., she continued to work with the Freedmen’s Hospital Nurses Committee, the Lend-A-Hand Club for Unmarried Mothers, the First Social Settlement and the National Association for the Advancement of Colored People.

On November 12, 1948, Dr. Sara Winifred Brown, the famed but then retired physician, philanthropist and teacher, was killed in a bus accident. Her death was an unfortunate loss to society, but she succeeded in leaving a legacy for other black women to follow.

by Wendy E. Austrie ’91
GYPY MOTHS. THESE PESKY INSECTS can mean death to an oak tree and pain and suffering to the person who must care for the tree. With the recent discovery of a Japanese fungus that kills gypsy moths, this troublesome insect may eventually be more controllable.

The Japanese fungus, Entomophaga maimaiaga, is a natural enemy of the gypsy moth in Japan, northern China and Korea. The fungus, as discovered by scientists at the Boyce Thompson Institute for Plant Research, a private, independent plant research organization at Cornell and the USDA Agricultural Research Service in Ithaca, produces a virus that can kill a gypsy moth.

The history of the gypsy moth is ironic, for it is the tale of how a man's dream for success can come crashing down upon him. A French businessman interested in establishing a silk industry in this country brought the gypsy moth to the United States in the late 1800s. Unfortunately, the gypsy moth soon became a forest pest instead of a silk producer.

The insect that was supposed to bring success has instead brought distress to countless tree owners. Since its introduction, the gypsy moth population has destroyed thousands of trees in the U.S. One of the worst outbreaks occurred in 1980 and 1981, when the moths defoliated approximately 13 million acres of forest in the northeastern section of the United States.

The necessary ingredient to kill gypsy moths and protect oak trees may be the virus that is carried by this Japanese fungus. The fungus was actually first discovered in forests last year by three North American caterpillar researchers in Connecticut. After uncovering large amounts of the fungus, scientists brought their find to the Boyce Thompson Institute for further study. Ann E. Hajek, an insect pathologist, has worked on the fungus at the institute since it was found in June 1989.

This year an experiment was performed in a wooded area near Cornell's Laboratory of Ornithology. In conducting the experiment, Hajek collected specimens of fungus-containing soil from the Ward Pound Ridge Reservation in Westchester, N.Y. and from areas of Massachusetts. She spread the central fungus around five oak trees with gypsy moth caterpillars on them in May and put insects already infected with the killer virus on two other oak trees. In mid-June the caterpillars came into

Ann E. Hajek with a dish of the evil gypsy moth caterpillars. New research may lead to environmentally safe controls for this pest of trees.
contact with the fungus, and on June 21 the fungal epidemic spread in the gypsy moth population.

The experiment marks the first time the Japanese fungus has been introduced into an area, but apparently it has been around for some time. It was only noticed after the fungal boom in the northeast last spring. According to Hajek, this fungal boom was certainly helped by the wet, cool spring experienced last year in the northeast region. Scientists traced the occurrence of the fungus, from Connecticut into such states as Massachusetts, New York and Pennsylvania. In New York, a large concentration was discovered in the eastern section of the state. Recently, Hajek found the fungus in the southern sections of Cayuga and Seneca lakes. It does not occur wherever gypsy moths do.

The fact that scientists can introduce the fungus into new areas gives hope that the Japanese fungus could help control huge gypsy moth populations. How does the fungus kill the gypsy moth? From their research, scientists discovered the fungus produces microscopic spores that attack the skin of the gypsy moth caterpillar. After it seeps through the skin, the bead-shaped virus quickly spreads throughout the insect. The caterpillar dies one week after initially contracting the fungus.

Scientists thus far have discovered the fungus growing naturally in ten states. In upcoming months, it will be introduced into areas of Virginia and West Virginia and other states recently attacked by gypsy moths. This introduction will help researchers further observe how well the fungus can establish itself in new environments.

How do scientists introduce the fungus into an environment? According to Hajek, the process takes place through the soil. Scientists place soil containing the killer fungus in new places, and the caterpillars that encounter the fungus contract the virus carried by the fungus. The fungus eventually affects the gypsy moth population in the surrounding area.

Hajek said the fungus will serve as a safeguard for the environment against the deadly gypsy moth. The fungus is revolutionary compared to other insect controllers, for it is only contractible by the gypsy moth and those closely related to it. It is a natural method of insect control which should prove to be an environmentally safe way of protecting oak trees from the clutches of the gypsy moth.

“We have come a long way in a short time,” said Hajek of the fungus research. In terms of insect control for the gardener and homeowner, Hajek said the fungus will not be available for some time. Scientists still need to study the fungus to learn how it can be used most effectively to control the gypsy moth and perhaps other types of insects.

Despite the fact that testing still needs to be done, the discovery of the killer fungus offers much hope for those with gypsy moth problems. Gypsy moth caterpillars can ravish an oak tree in a very short time, leaving the owner with a very weakened tree. After several oaks become infested with the moths, the surrounding trees are doomed. With the discovery of the killer fungus, it may be possible to one day look out your window without the fear of what happened to the leaves of your oak tree last night, when the gypsy moth caterpillars were awake and you were not.

by Kathryn Lancioni ’92
less is MORE

Studying low-input farming on Shaul Farm in New York.

Pennsylvania Farmer Bob Russo used to have an expensive problem on his farm. Allowing his cattle to graze on the farmland was costing him 26 tons of soil per acre each year and even more in terms of lost productivity.

But Russo turned things around. He switched to a new technique called rotational grazing. Cows alternate between different pastures from year to year and new crops are planted in the pastures to keep the land healthy. Russo now loses just three tons per acre each year to soil erosion, saves about $800 a month in feed costs, and has extended his farm's growing season by half a year.

Russo's story comes from the federal government's Low-Input Sustainable Agriculture program. It's just one of many recent instances of American farmers adopting new techniques to increase profitability and decrease environmental damage. And it's an area in which researchers from Cornell University's College of Agriculture and Life Sciences are at the forefront.

"The simple thought behind low-input sustainable agriculture is to reduce the use of those things that cost farmers money while maintaining productivity," explained Brian Chabot, director of research for the ag college. Those include farming "inputs" like feed, labor, machinery, and chemicals.

Chabot said the desire of farmers to decrease the use of synthetic fertilizers and pesticides is a prime cause of the recent changes. "Farmers are concerned about the impact of these materials on their health and the health of their families," he said. "Most of those things are applied right around their homes."

Chabot's office oversees 11 different projects at Cornell aimed at minimizing the use of inputs. The projects cover a wide range of new techniques. Research ranges from disease-resistant fruits to the use of legumes to fight weeds and maintain soil quality, from how to educate farmers about low-input sustainable techniques to the techniques' social implications.

Jane Mt. Pleasant '80 MS '82, an associate professor in the Department of Soil, Crop, and Atmospheric Sciences, heads one of the projects. On farms in Aurora and Mt. Pleasant, New York and at several private farms in the state, Mt. Pleasant studies alternative methods of weed control. Her research involves comparing the use of chemical herbicides, mechanical cultivation, and a mixture of the two.

"We're comparing ten different cropping systems," Mt. Pleasant said. "All of the cropping systems have been divided into three different levels of weed control: one in which we rely on our best chemical treatment, another in which we use cultivation, and a third in which we use a mixture."

So far, Mt. Pleasant said, the results have shown low-input sustainable farming to be effective. The researchers combined herbicide use and cultivation to decrease chemical inputs by two-thirds and maintain profitability.

The profitability of low-input sustainable agriculture is an essential for Mt. Pleasant. "Sustainability, according to my definition, means it has to be economically viable as well as environmentally sound. If you're going to reduce inputs, you have to prove yields are going to be maintained. And if there is a decline in yield, it has to be more than offset by a decline in inputs."

CALS researchers are looking at farmers' minds as well as at their methods. Projects are underway to determine the social and cultural factors involved in low-input farming.

Fred Buttel, chair of the biology and society major and a professor of rural sociology, has just completed a study of chemical use on New York state farms. His findings were a bit surprising. "In contrast to what many critics and boosters of chemicals say," Buttel said, "there is already a fairly large segment of farmers who use no fertilizers, no pesticides, or use neither."

According to Buttel, about 15 percent of the state's farmers fall into the above category. And, he added, many others want to do the same but are worried about the financial consequences. "A fairly large majority indicated they'd prefer not to use chemicals if it didn't affect their income."

Buttel cited higher energy costs and tougher water-quality restrictions as two factors which could make the new techniques more popular in the future. But he cautioned that the outlook for low-input sustainable farming is uncertain. Future economic trends, he said, could kill what he sees as a good idea. "If there were an increase in export markets and growth [for farmers]," Buttel said, "I believe many of these gains could be lost."

Chabot and Mt. Pleasant are equally cautious but more optimistic than Buttel in their outlook. "I think low-input and sustainable techniques are going to have a substantial impact on American farming," Chabot predicted. "I don't know that they will totally revolutionize it, but they're certainly presenting a series of issues to American farmers that they're going to have to address."

By Alex J. Nussbaum '92
They taste good, too!

FORGET THE DEBATE ON WHETHER the tomato is a fruit or a vegetable. Tomatoes may be able to have a longer shelf life and, as a result, naturally taste better due to a new chemical treatment created by a team of plant researchers and scientists in the College of Agriculture and Life Sciences.

If patented, this treatment could have a major impact on the nation's $1 billion tomato industry, according to Peter J. Davies, a professor of plant physiology in the College within the Division of Biological Sciences. Davies led the research on the process. "This new process would allow growers to pick tomatoes off vines just as the tomato begins to ripen," Davies explained. "Once a tomato begins to ripen, it will ripen naturally. They taste much better that way, and the consumer would be more pleased."

The new process would allow tomatoes to be picked just as the reddish color appears on the skin. Currently, growers pick tomatoes off vines when they are still immature and green. "Growers do this in order to provide about two to three weeks' time to shippers for delivery to supermarkets before the tomatoes ripen," Davies explained. "Otherwise, they would arrive at the stores rotten."

The new treatment involves adding a chemical called polyamine to tomatoes. "Polyamines naturally occur in all tomatoes and slow down the ripening process," Davies said. "Simply by adding the same amount of polyamines that a tomato itself already contains can double its shelf life. The normal ripened tomato has a rather short shelf life of about four to five days before it becomes squishy."

The Alcobaca tomato from Brazil, however, has a natural shelf life of about three to four months. Martha A. Mutschler, an associate professor in the Department of Plant Breeding and Biometry in the College, has been studying the genetic composition of the Alcobaca tomato since 1980. "In the Alcobaca tomato, a single mutant gene was discovered to severely slow down the ripening process," Mutschler said. "This mutant gene alters the expression of other genes which are related to ripening."

Mutschler wanted to further investigate the effects of the gene, and brought the tomato to the attention of Davies, who specializes in plant hormone research. Davies gave the Alcobaca tomato as a separate project to Andrew Dibble, a graduate student who was asked to analyze the polyamine content of the fruit of this Brazilian tomato. "In the laboratory, Dibble found that the Alcobaca tomato had a higher content of polyamines compared to the normal variety," Davies said. "We then began experimenting with increasing the level of polyamines—specifically one called diamino butane—in normal tomatoes. Results showed that these tomatoes became firmer and had a longer shelf life."

The polyamine is added to the tomato through vacuum infiltration, Davies said. The tomato is placed in a container filled with the chemical solution. As air is sucked out of the tomato, the chemical solution is drawn into it when the vacuum is removed.

This new chemical process would drastically change the current commercial practice in picking and treating tomatoes. Growers currently treat the green tomatoes they pick with ethylene, a naturally occurring ripening hormone, to obtain the traditional red tomato color. "This is not natural ripening," Davies said emphatically. "The taste is just not as good as that found in tomatoes which ripen on the vine. Also, the shelf life for the normal tomato is just too short." Let it spend a week in the refrigerator, and it is no longer a firm tomato!

Too much refrigeration actually lowers the quality of tomatoes, according to Mutschler. "But if all the materials were used properly, the new method would markedly improve the quality of tomatoes," Mutschler said. "The process really needs to be tested over several growing seasons, since a new trait usually takes five to ten years to develop."

The process is awaiting patent approval at the Cornell Research Foundation. This patent office is responsible for promoting any commercialization of research conducted at Cornell, Davies said.

As for potential public protest against the addition of the polyamine to tomatoes, Davies does not believe reasons for such concern exist. "Believe it or not, we eat polyamines every day," Davies said. "They are naturally present in all meats, fruits, and vegetables, and are not toxic."

As Davies and Mutschler await finalization of the patent, each is conducting separate research on tomatoes. Mutschler is investigating the genetic basis for insect resistance in tomatoes. Davies is studying other plant hormones which may also contribute to retardation of ripening in tomatoes.

"Because we're still waiting for finalization of the patent, this new process has not yet been used commercially," Davies said. "It needs to be tested further, obviously. I must say there is no absolute guarantee that it will extend the shelf life and cause greater firmness in field-grown tomatoes."

"But, so far, laboratory experiment results seem to indicate that the process is and will be successful in improving the tomato."

by Betty Ng '91
THE HOWARD ALBERDING FIELD House is a great new addition to Cornell. The planning of this multipurpose building began in 1983 as part of a big project aimed at expanding and improving Cornell’s sports facilities.

The field house, which is located at the site of the old parking lot by Lynah Rink, includes one of North America’s greatest climbing walls. Laing E. Kennedy ’63, director of athletics and physical education, said the total cost of the athletic facility project is estimated to $28.5 million.

“There has been an enormous increase in athletic activity the last 20 years, especially in women’s athletics,” said Kennedy. “There have been no expansions since the construction of Helen Newman in 1963,” continued Kennedy, “but the number of physical education classes has increased a lot. Cornell offered around 50 physical education classes in the 60s, compared to 147 in ’89/’90,” he added.

Kennedy now has the largest intercollegiate and intramural program in the Ivy League: almost 10,000 students are involved in physical education courses, 12,000 compete intramurally and 1,200 students are on one of the 36 intercollegiate teams.

Upgrading rather than expanding was the motto for the intercollegiate sports. “The field house,” said Kennedy, “takes over some of the varsity sports from Barton, Teagle, and Helen Newman halls, and so leaves them free for intramural and recreational use.” Coaches, teams and students pulled together and went through moving and disruption without too much trouble.

“The field house,” said Kennedy, “takes over some of the varsity sports from Barton, Teagle, and Helen Newman halls, and so leaves them free for intramural and recreational use.” Coaches, teams and students pulled together and went through moving and disruption without too much trouble.

“I am not sure I would go through that again, though,” added Kennedy.

The Alberding Field House was officially opened January 20, 1990, after a one-and-a-half year construction period. Basketball, baseball, lacrosse, soccer and field hockey teams have their indoor base in this spacious “White House” of Cornell athletics. Three full-sized basketball courts can easily be transformed into a center court with 4,500 spectator seats, by means of telescoping bleachers, an ingenious kind of mobile fold-away seats.

The field sports have 27,000 square feet of artificial turf to train on when outdoor fields get too muddy and frozen. All the coaches, who previously had offices scattered all over campus, now have individual offices in the field house. A desperate need for locker rooms has also been provided for. “The opening of Alberding Field House represented a 40 percent increase in locker room availability for intercollegiate, intramural, and recreational ath-
The three basketball courts can be transformed into one centercourt surrounded by 4,500 spectator seats.

I believe the Alberding Field House will become one of the grand old buildings of Cornell," said Kennedy. "I am proud of how the architects have implemented everything. Street design, street lighting and landscaping have not been overlooked."

It is likely that the building will remain impeccable, as a maintenance endowment exists. Only previous Cornell athletes and friends of the athletic department were asked to contribute with donations to the field house. The fundraising campaign was successful and provided the $16.6 million necessary to construct the building, as well as the maintenance endowment.

Among the larger contributors was Charles H. Alberding engineering '23, after whom the field house is named. "It is all a very sad story, because Alberding passed away before the completion of the field house," said Kennedy. "The actual funds are tied up in his estate, but I am confident that there will be no problems. I remember I asked Alberding why he wanted to use his middle name, Howard, when naming the field house, rather than his first name. He replied: 'That is what my mother used to call me.'"

by Annike Hoysater '91
THIRTY YEARS AGO, AMERICAN WOMEN were baby-makers. Donna Reed set the standards, and the mother who cooked and cleaned was doing her part. But times have changed and the Donna Reed prototype is a distant memory.

The extension of women's education, coupled with the onset of the women's movement in the mid-1960s, challenged the traditional dictates that confined women to the kitchen and away from the boardroom. Since then has come the diffusion of the ideas that affect individuals' motivation to form families and rear children.

Somewhere in the 1980s, Americans came to worship career status as a measure of individual worth and became willing to sacrifice the family for personal goals. Those Americans were the baby boomers who grew up and became yuppies. They are so numerous that they have defined not only a generation, but an entire culture—a culture more committed to careers than to relationships. "Our professions have become very important to us," said Susan Dark '83, who majored in agricultural economics. "We're willing to perhaps sacrifice other things for them—marriage, family, free time and relaxation. Our marriages seem like mergers, our divorces like divestitures," said Dark.

Something happened on the way to the 21st century: our society exchanged traditional values for materialism, self-fulfillment and instant gratification. These values, enshrined in every aspect of American life, have created a generation of youth that is struggling with adulthood. Today's youth are taking longer to grow up. More young Americans are enrolled in college, but fewer are graduating. They are taking longer to get their degrees, establish careers and marry.

Adulthood implies commitment and self-discipline, and by these standards, young Americans are much less mature than the previous generation was at their age. The difference is evident in all areas of development, including education.

Today, higher education provides a slower transition to adulthood than the passage their parents experienced. According to Dawn Schrader, an assistant professor in the Department of Education, today's students are taking longer to take on traditional adult roles because of the job market. "There is an increasing demand for professionals, and thus more students are attending graduate school. If students want advanced careers, they have to have advanced degrees. As a result, people are entering their first job at the age of 25 or 30, compared with their parents' generation who entered the job market at 21 with undergraduate degrees," said Schrader.

Furthermore, fewer students are using higher education as a vehicle for self-examination. For the last 23 years UCLA's Higher Education Research Institute has published a report surveying the trends in the life goals of 250,000 full-time college freshmen. In 1970, students wanted "to develop a meaningful philosophy of life." In 1989, the majority responded that they wanted to be financially well-off.

Students today are defining themselves through money, power and status, and are choosing courses of study that will get them these things. Schrader attributes this to the economic reality facing students in 1990. "Adolescents are aware that today's economy is volatile and there is a lot of fear and insecurity about the future. The American dream has not changed, but the means for attaining it has. They want to achieve the same level of prosperity enjoyed by their parents' generation and they will enter career-oriented majors and go to graduate school if the degree can insure that they will live the good life," said Schrader.

Schrader is presently involved in a study to determine the social and personal values held by a cross-section of 500 Cornell students in the College of Agriculture and Life Sciences. She has found that the majority value honesty, mutual respect and self-achievement the greatest. Her study shows hope for the future; there are young adults that defy the norm who are working hard and arriving at adulthood with a sense of commitment and responsibility. But for the majority, the passage to adulthood will be slow into the next century.

Ultimately, the question is one of cultural values. Children learn by example and they have been shown a society that is preoccupied with consumerism and instant gratification. When America's values change, so will American youth.

Adulthood implies commitment and self-discipline, and by these standards, young Americans are much less mature than the previous generation was at their age. The difference is evident in all areas of development, including education.

by Hilary Nagler '91
Funding for the 21st Century

ON OCTOBER 19, 1990, CORNELL University’s board of trustees approved a five-year, $1.25 billion fundraising campaign to “re-endow the University for the 21st century.”

President Frank H. T. Rhodes announced this ambitious campaign at the annual joint meeting of the board and the university council (440 alumni and friends who volunteer for Cornell throughout the nation and the world).

Rhodes told the audience: “We are undertaking a campaign for the future. You this year and next year and the year that follows will see virtually no direct benefit from the campaign. What we are doing is making things possible for those who have the affairs of the next century as part of their horizon.”

Rhodes added that the campaign is not meant to add anything on to the university. “It is designed to reinforce what we are already doing,” Rhodes said, remarking that the University will be “better, not bigger.”

Rhodes also spoke of what he called the “hostile climate” in which education finds itself, specifically noting the reduction in funding from both federal and state governments. Rhodes cautioned that New York state’s fiscal situation was likely to lead to another round of multimillion-dollar cuts over the next year for Cornell’s four state-supported units—the College of Agriculture and Life Sciences, the College of Human Ecology, the College of Veterinary Medicine and the School of Industrial and Labor Relations.

State-supported units at Cornell have been hit by five separate budget cuts from the state of New York over the last three years. The latest round of cuts imposed by the state in July and August 1990 included a reduction of $3.1 million in base budgets. David L. Call ’54, MS ’58, PhD ’60, dean of the College of Agriculture and Life Sciences, remarked in the Cornell Daily Sun that the new campaign is desperately needed, especially after state cutbacks. Call commented in the Cornell Chronicle, “The campaign is essential if we are to maintain the level of excellence expected of us.”

Call remarked in the Chronicle that though the ag college is widely perceived as a state school, it currently receives only 40 percent of its funding from New York state. The rest of the operating budget comes from Cornell, through tuition and endowment.

The trustees have targeted the $1.25 billion to be used in five areas: support for teaching and learning programs, endowed faculty and other positions, undergraduate and graduate financial aid, library support and renovation and construction—as shown in the accompanying illustration.

Call said, in the Chronicle, “A permanent base of support is a must if we are to have the flexibility to move into new areas, experiment, take risks and stay in the forefront, especially in emerging studies of environmental issues and the globalization of agriculture and our economy.”

A significant portion of the campaign goes toward supporting student financial aid. Call commented in the Chronicle that “endowment for financial aid is imperative if we are to continue reaching the students who will be our future leaders.” The specific goal of increasing support for financial aid follows a sharp, decade-long decline in federal financial aid grants for middle-income and needy students. From 1980 to 1990, the federal share of support for Cornell’s financial aid students increased by about nine percent, while Cornell’s own share increased by 372 percent.

Pointing to the future, Rhodes said, “I believe the most precious resource that we can offer is this continuing stream of educated, talented, committed men and women, educated as opposed to trained, educated as opposed to simply well-informed.”

Closing his presentation to the board, Rhodes remarked that the University must provide itself the means to reassert its original tradition, according to which “Cornell stressed knowledge, not as an end in itself, but as a means to serve human needs.”

To date, approximately $330 million has been pledged to Cornell through the new campaign. Rhodes called this drive a turning point in Cornell’s history because if it is successful, it will “re-endow the university, will transform it in a way that few of us are completely conscious of at this moment.”

by Jeffrey S. Popow ’91
FIVE THOUSAND GALLONS OF TOXIC pesticide are spilled when a truck overturns on a slippery road. The surrounding area’s water supply is in jeopardy. How should journalists cover this event? How should they clearly and accurately report the facts without causing unnecessary panic?

These are two questions addressed by students now taking Science Writing for the Mass Media, said Assistant Professor Bruce Lewenstein. The course, taught by Lewenstein, is one of several comprising the newly established science communication sequence, one of several sequences in the ag college’s ten need to be covered within a specific scientific and social context, Lewenstein said.

“Science journalism works in terms of trends,” he said. “These are trends which are punctuated by specific events, such as a new article being published by researchers. Journalists tend to treat them as straight news, when they are really part of a trend.” Trends can function as appropriate contexts in which to discuss and explain new information.

Coverage of the cold fusion sensation of March 1989, when two scientists claimed to have achieved nuclear fusion, normally only possible at temperatures found at the sun, is a good example of how “traditional” journalists often take the wrong approach to science news, said Lewenstein, who is also co-director of Cornell’s Cold Fusion Archive. “When those two scientists in Utah first held their press conference, the media covered it immediately as an incredible event,” he said.

On the other hand, he added, scientists writing about cold fusion took more time to start doing so, rather than immediately jumping on the bandwagon and possibly sacrificing accuracy as well as proper perspective. And while most journalists completely stopped writing about the issue only six weeks after the initial coverage, said Lewenstein, scientists now are still discussing the controversy. “Among responsible scientists, it is still not all clear what happens when you set up a cold fusion

Mass Media, agrees. “There are constant controversies about science and important issues in science,” Shapiro said. “Science can often be uncertain; it is bad to assume that science knows less than it does, but it is also bad to place ‘blind faith’ in science, because science doesn’t always know the answer.”

Science journalists need to recognize this, said Shapiro, and need to convey it to an often misinformed public. Dr. Robert Logan, associate professor and director of the Science Journalism Center at the University of Missouri, agrees. “Surveys taken over the past ten years have shown that the public’s understanding of science and medicine is inadequate,” he said. “Most Americans are seriously misinformed about science and medicine.” As a result, he concluded, “there is a real, desperate need for qualified people to be liaisons between science and the public.”

Getting students comfortable with science and making them aware of science issues is one way to prepare them for this role, said Lewenstein. This is precisely one of the sequence’s goals. The sequence, one of five in the communication major, requires students to take 42 credits of science courses to meet this goal. In addition to traditional courses in biology, chemistry and the like, students can opt to study the history and philosophy of science. Because the sequence is so flexible, students must have their course choices reviewed by the department’s Science Communication Committee.

BRINGING science

Department of Communication.

“Science journalism is fundamentally different than other kinds of journalism,” stated Lewenstein, explaining why special science communication instruction is necessary. As opposed to “straight” news which can be covered effectively in terms of specific non-science events, science-oriented issues such as the environment and energy of-

This flexibility and variety, said Lewenstein, is encouraged by the department, as it is very important in preparing students. “By providing the option for these history and philosophy of science courses, we hope that students can build a perspective on science. We want students to know what intelligent questions to ask,” said Lewenstein.
Intelligent questions, he said, not only include appropriate technical questions, but social, economic and political ones as well. For example, he suggested, whenever the space shuttle doesn't launch on schedule, students should ask whether it is worth it to keep funding a shuttle that has frequent technical difficulties.

Many agree that Cornell, with its resources, provides a solid base for science communication. "Cornell is a world-class research university," said Shapiro. "There are all kinds of cutting-edge science going on. There is lots to write about and lots to learn." Logan echoed this opinion. "A university such as Cornell is one of the ideal places in the country for something like a science communication sequence," he said.

But besides knowing science, students must also know how to communicate effectively. As a result, students in the sequence must complete basic and advanced writing courses offered as part of the communication major. They must also complete one science writing course, such as Science Writing for the Mass Media, where they learn methods to convey scientific and technical information in a manner that is understandable to the public.

One method Lewenstein teaches his students is the use of metaphors and analogies. "It's a trick," he said, "but one a journalist normally tends not to think of." For example, he said, science journalists can describe measurements in universally understood terms, such as comparing a minute measurement to the width of a human hair.

In addition to helpful tricks, students learn the different roles of science journalism. This is taught through exercises in reporting hypothetical situations, such as the pesticide spill mentioned earlier. In that scenario, science journalists would have to decide whether to handle the story as straight news, or as a story educating the public on potential risks, without overestimating or underestimating those risks. "It's often a trade-off," said Lewenstein.

In terms of a cold-fusion type situation, he said, "I would hope that some of our students would not cover the story the first day, but take the time to gather background information." Students, he said, should then decide which is the best way to portray the news.

Alex Nussbaum '92 is a student in Lewenstein's class. "[Lewenstein] is an amazing professor when it comes to showing us how to communicate about science. He's trying to show us the cultural background of scientists and journalists and to see each's limitations, but also how both can work together," said Nussbaum. "I think I'm learning a lot," he added emphatically.

Approximately 20 of 300 undergraduate communication majors are now enrolled in the science communication sequence. This small portion, about five percent, is not seen as a problem, considering the fall of 1990 marks the sequence's first "full" year.

Although the sequence is technically new, it has been in the making for several years, said Professor Paul Yarbrough. Yarbrough, who came to Cornell in 1982, chaired a committee in 1985 that studied the possibility of creating a science communication sequence. However, he emphasized, the idea had already been conceived before his coming to Cornell. "Putting together a sequence was not a task which had to be done from scratch," he said, "It was more a matter of putting together resources already here." These resources included faculty already doing research in science communication, as well as science and science communication courses already offered at Cornell.

Future plans for the sequence are uncertain, especially in light of the budget crunch, according to Lewenstein. The department might add an advanced science writing course and a technical writing course, where students will learn to write highly technical material such as manuals.

But for now, the emphasis is on quality of the sequence, not size. "We're not trying to be a big sequence," said Yarbrough, "just a good one, an excellent one."

It seems that they're off to a solid, scientific start.

by Maria Politis '92

**Down to Earth**
WHERE ON CAMPUS CAN YOU FIND
the Flag Room, International Cafe and
144 people from over 40 different
countries under the same roof? At the
Jerome H. Holland International Living
Center.

The Holland International Living
Center (ILC), is a residential pro-
gram house on North Campus which
consists of 60 percent foreign students
and 40 percent American students. The ILC
will celebrate its 20th anniversary this
spring.

"The purpose of the ILC," said food
science student Taras Sudhikam '93,
ILC resident from Thailand, "is to bring
people together to have a feel of what
other cultures are like. It gives us op-
portunities to adapt to and absorb new ideas."

"ILC is a refuge for 'stranded' interna-
tional students," said former ILC resi-
dent assistant, microbiology student
Raphael Valdivia '91 from Peru. "It's a
family for those who have left home
and are now on their own. It is also a
bridge to international understanding," he said.

There are many opportunities to
grow closer to and learn from one an-
other through day-to-day interactions.
For example, at mealtimes many ILCers
(as they call themselves) talk, laugh and
share ideas as they squeeze as many as
12 people at a round table in Balch Dine-
ing or occupy three tables in the Robert
Purcell Union Dining. Valdivia said,
"It's a 24-hour learning experience."

When the Holland ILC opened its
doors in the fall of 1971, the Depart-
ment of Residence Life, Unions and
Activities and the International Stu-
dents and Scholars office contributed
funds to ensure programming in the
hall. In 1985, Jerome H. Holland MS '41
set up a fund to maintain the various
programs.

The Holland ILC is the only resi-
dence hall with an endowment fund in
which the earnings are used to support
the programs and facility. Some of the
programs include fall and spring semes-
ter canoe trips, ski trips, fall and spring
break trips, holiday parties, internation-
al dinners, international cafe, two semi-
formal dances, weekly talks organized
by the International Affairs Group (IAG)
and nightly coffee hours.

The activities bring residents out to
do things and work together. "The cof-
fee hours," said agricultural economics
student Christina Fredericks '92 from
Malaysia, "get people to take a study
break, to meet other residents and
catch up on each other."

Similarly, residents are eager to take a
break from their studies to help prepare
food and decorate the ILC for the in-
ternational dinners and parties. The
ILC has had Mexican, Chinese and
other international dinners and the
semi-formal dances centered around
themes such as "Venetian masquerade,
"cruise ship," "Hollywood" and "Carib-
bean Carnival."

Activities also extend beyond the
International Living Center. "Commu-
nity Outreach gives the international
people chances to interact with people
in the community," said Fredericks.
Community Outreach is a program
where residents get together to visit
underprivileged children, throw holi-
day parties or participate in other ac-
tivities involving the community. Since
community service is either a foreign
idea or not something encouraged by
the government in many countries, op-
portunities to participate in such activi-
ties expose international students to
new ideas, thus broadening their per-
spectives.

Caring, togetherness and the ex-
change of cultures is what Jerome H.
Holland and the University had in mind
for the ILC. Holland was a man who
held several distinguished intercultural
honors including ambassador to Swe-
den, first black member of the New
York Stock Exchange, trustee of the
Foreign Policy Association and a mem-
er of the boards of the Institute of In-
ternational Education and the National
Geographic Society. In 1985, Holland
was awarded the Medal of Freedom,
the highest civilian award given by the
United States.

Jerome H. Holland left his legacy at
the International Living Center. Each
international student living in the ILC
will go home richer with new friend-
ships and an education they could not
have obtained at home. The many ex-
periences gained during their stay at
Cornell and the Holland International
Living Center will help them in their
roles as the potential leaders of their
countries.

by Christina Yee '92
"I WOULD FOUND AN INSTITUTION where any person can find instruction in any study." Ezra Cornell would be pleased to know that many Cornell University undergraduates have found further instruction in their fields of study as "double Reds"; that is, by continuing their educations in Cornell graduate and professional programs.

The Graduate School has the largest enrollment of the Cornell post-baccalaureate programs, with 4,390 students. Approximately one-seventh of these graduate students received their bachelor's degrees from Cornell. Among them is David Livesay '84, who expects to earn his Ph.D. in the History and Philosophy of Science and Technology program this year.

"Going to another college was not an option," said Livesay, the son of a mathematics professor. Livesay completed his bachelor's degree under the Cornell Children's Tuition Scholarship, and has worked as a teaching assistant (TA) to cover tuition and other costs for most of his graduate studies. Livesay, who plans to teach college biology, said of his experiences as a TA, "I got a good education in the very thing I wanted to do. You learn more from doing it than you do from taking any course."

Many Cornellians continuing their studies as "double Reds" are not in the graduate school; they make strong showings in other Cornell programs for the study of business, law, medicine or veterinary medicine. Seven percent of the 1990 entering class of Cornell Law School hold Cornell degrees, according to Nan Colvin, registrar of the law school. Chet Scoville '90 is one of these people.

"I'm most interested in the International Law program, which is incredibly strong and quite widely renowned," said Scoville. "The faculty are very available, very friendly and quite approachable."

Scoville had personal reasons for choosing Cornell for his J.D. "I've come to regard Ithaca as home, a place I was comfortable being," said the former New Jersey resident. "I wouldn't want to be anywhere else."

The Johnson Graduate School of Management (JGSM) has an even higher concentration of Red than the law school; twenty percent, according to James Schmotter, associate dean of the school. "Students with Cornell degrees have two advantages," said Schmotter. "First, because Cornell is a selective undergraduate institution, the average Cornell student is better than the average college student. Second, admissions staff of JGSM know the Cornell curriculum better than they do those of other colleges."

What criteria are used in admissions decisions? "What we're looking for are smarts, academic excellence, and preparation... realistic expectations of what the M.B.A. can do," Schmotter said.

Gordon Suggs '85 MBA '89 knows what a degree from JGSM can do: he is now assistant director of workstation support services at Cornell Information Technologies. Suggs had chosen Cornell as an undergrad for its range of programs. "I hate to say diversity, but that's what it was," he said. And when he was ready to enter the business school, Suggs said, "I didn't have the unsteadiness of changing location while making the change [into graduate school]."

Like Suggs, Erik Johnson '90 was attracted to Cornell's diversity. The difference is that his surroundings did change abruptly as he began his first year at Cornell University Medical College in New York City.

"I like the idea that I'm still part of the Cornell superstructure," said Johnson. "I didn't want to have to adjust to a med school attached to an undergraduate college." The small size of his entering class (101), the college's East Side location and its affiliation with medical institutions such as The New York Hospital and Memorial Sloan-Kettering Cancer Research Center also influenced his choice of Cornell over other medical colleges, including those of Yale and Columbia universities.

"There are 24 Cornell graduates in my class alone," Johnson said. "I think the average is 18 to 25 percent." He explained that Cornell seniors are guaranteed interviews with the medical colleges.

Johnson has come back to Ithaca several times this year, and admits to missing it. "It's serene and open and green and alive, not cold and stone," he said.

Carolyn Sarna '89 has centered her studies around this "aliveness": now a second-year student of the College of Veterinary Medicine, she chose Cornell undergrad for the opportunities for veterinary experience during her undergraduate years. She said that working in the Large Animal Research and Teaching Unit helped her to clarify her interests as she came closer to vet school. "There are many research opportunities that already exist here too," she said. "You don't have to come up with your own project if you want to do research."

Sarna is one of 32 Cornell alumni in her class of 80. According to the admissions office of the vet college, Cornellians have no major advantage over non-Cornellians. That there are so many in the college is probably because people who plan to go to vet school tend to choose Cornell for their undergraduate work, according to a staff member. "I don't think, gradewise, Cornell students do better," Sarna commented.

Their grades may or may not reflect it, but the familiarity of the Cornell name can ease the transition between phases of learning, and stages of life, for the "double Reds."
"IN CASCADILLA CREEK'S DESCENT from the lands above there are many picturesque gorges and beautiful cascades." Landmarks of Tompkins County, 1894.

Ithaca's Cascadilla Gorge has weathered much in the century since this was written, but thanks to the hard work of some dedicated admirers, the gorge continues to provide many breathtaking photo opportunities along its trail. The Cascadilla Gorge Trail, which had its beginning in the 1920s, starts at the southern boundary of Cornell University in Collegetown and traces Cascadilla Creek to downtown Ithaca where University Avenue meets Court Street. The trail has been closed several times in the past seventy years for repairs to fix the ravages of time. Its most recent closing of nine years ended September 15, 1990 with an official reopening which marked the end of a massive repair and improvement job spearheaded by the Cornell Plantations. Margaret Corbit, communications manager for the Plantations, said that hikers are happy to be walking the Cascadilla Gorge again.

According to Corbit's article, "Cascadilla Gorge," the gorge has been used by many different people throughout the years. During the early days of Cornell University, students housed in Cascadilla Hall on one edge of the gorge hiked down one side and up the other to get to their classes, which at that time were located where West Campus housing stands today.

Corbit explained that in 1903, a group of environmentally-conscious University trustees committed Cornell to preserving the gorge's natural beauty. Two Cornell trustees in particular, Robert Treman 1878 and Colonel Henry Sackett 1875, were most influential in protecting the gorge from destruction. Treman, as head of the Cascadilla Company, began buying up private land parcels along the gorge's edge, and then donated the land to the University for use as a park. In 1926, Treman and his wife personally donated the park, now called Treman Triangle, at the base of the gorge. Sackett gave his own money to support the building and maintenance of the Cascadilla Gorge Trail, which was cleared and constructed by 1930.

Since then, work crews have battled both the elements and trash in order to keep the trail safe and clean. Corbit said that storms have routinely washed rock debris, garbage and even whole trees onto the trail. Severe storms—such as Hurricane Agnes which blew through Ithaca in 1972—forced officials to close the trail because of these washouts.

The trail was most recently closed in 1981 when storm debris and high water severely eroded the trail. Since 1987,
Trail Reopens

The Cornell Plantations has worked on repairs and some new construction on the gorge trail. According to Corbit, a total of nearly a quarter of a million dollars was spent on the project; most of the money came from the Sackett trail endowment fund, with university funds in the Newman endowment covering the difference.

Cornell Plantations staff members joined with university employees on the ambitious trail renovation project. Among other tasks, workers built sturdy foundations for the steps and strung chain safety railings from heavy wooden posts. One hundred thousand dollars went toward a new stone stairway at the trail entrance near Cornell’s new Center for Theater Arts in Collegetown. Plantations arboretum crew manager Hal Martin explained, “The stairs are supported by a massive bulkhead able to withstand the raging torrents of Cascadilla Creek.”

Corbit remarked that dedicated volunteers were instrumental to the renovation project and continue to help preserve the beauty of the gorge. During Collegetown Clean-up Days each spring and fall, Collegetown residents, fraternity brothers and other nature lovers help Cornell Plantations staff clear debris and remove tons of trash from the gorge. Corbit said that trash has always accumulated in the gorge, and that the clean-up volunteers often fill several Plantations trucks with old pizza boxes, beer bottles and an occasional appliance.

Although quite a few people use the Cascadilla Gorge Trail to commute to work, most hikers are nature lovers simply looking for quiet time and exercise. Since the trail’s reopening, Corbit said that hikers are welcome between dawn and dusk until late autumn, when the danger of ice forces its closing until spring. Cornell Plantations officials advise using caution in rainy weather and urge that hikers seek safety during thundershowers, in case of flooding.

With respectful care by its patrons, careful maintenance by Plantations staff and volunteers and a touch of mercy from the elements, the Cascadilla Gorge Trail will live on. There is no better place for students, community residents and visitors to find some of Ithaca’s tranquility.

by Catherine G. Healy ’92
STOCK
Talk

WHAT HAPPENS WHEN AN AGRICULTURAL economics major teams up with a finance professor from the School of Hotel Administration to study a stock market crash? Their findings become a lead story in the Wall Street Journal.

Ejnar Knudsen '91 was an agricultural economics student who approached Professor Avner Arbel to discuss program trading shortly after the October 13, 1989 mini-crash on Wall Street. Program trading is a computer program designed to automatically buy or sell stocks based on stock market information.

The market fell 190 points on October 13, 1989, Knudsen explained, and the public was worried. Brokerage firms were afraid that investors would pull out of the market. Several firms, including Merrill Lynch, said that the mini-crash was caused by program trading. Knudsen thought otherwise. "I think this program trading is a scape-goat. The security firms have to blame something to explain to the public why the market dropped," said Knudsen.

Arbel asked Knudsen, who was a student in Arbel's investment management course, to help him research stock volatility and whether program trading affects it. This allowed Knudsen to use the hotel school's state-of-the-art database to conduct research dealing with a tangible, real-world situation.

Knudsen is one of many students who have used the $2 million International Business Machine Corp. research computer given to the hotel school by IBM. The high-tech database provides Cornell students with the best possible information concerning finance. "We get the same information at the same time that [large brokerage firms] get it, even at the highest level," said Arbel.

Although many universities have computerized finance and stock information, this type of computer is unique to Cornell, said Arbel. "This doesn't exist at any other university in the sense that large companies, like Merrill Lynch, share information with a university. We are the only ones to get it," he said.

Students enjoy working with the computer, added Arbel, because the high-tech aspect is a new experience for them. "Students don't like dirty work and this cuts much of the dirty work of collecting data," he said.

Despite its advanced capabilities, the database is surprisingly easy to use. "Computers today can do a tremendous amount of quantitative work in a fraction of the time that it would have taken seven years ago," said Renny Pontvert from Valueline Inc. Investment Advisors, one of the companies that feeds information into Cornell's computer.

The computer does more than just save professors and students time and trouble. It also allows them to research topics that are timely, because the information is so current. In fact, the research on stock market volatility and program trading done by Arbel and Knudsen was so relevant to what was happening on Wall Street that the Wall Street Journal featured it on the front page of the November 7, 1989 finance section.

This database provides students with good experience pertinent to real world situations, Arbel explained. "Students [who use this computer] get quite good job offers and many continue on to graduate school. Many students come to do research with me for no pay and no credit. They do it for experience," said Arbel.

Although the database belongs to the hotel school, students from other Cornell colleges may also have access to it through finance professors. Arbel said that 20 to 30 percent of his investment classes consist of students from the College of Agriculture and Life Sciences. Many are agricultural economics students who want experience and research in areas outside of agriculture. "There is a special interest among agriculture students. They are hungry for applied information relating to financial markets," said Arbel.

Agricultural economics student Knudsen certainly benefited from use of the database. In fact, Knudsen, who used the computer while at Cornell on a one-semester exchange from California Polytechnic State University, San Luis Obispo, decided after doing this research to transfer to Cornell for good. This delayed his graduation by a year, but Knudsen said it was worth it to use the computer and work on current research.

"I drove through Cornell three years ago and said to myself, 'I'd love to go here and just take classes,'" said Knudsen. Now he will have more than a Cornell degree to show employers when he leaves. He has also gained experience on Cornell's state-of-the-art finance research computer and taken part in a stock volatility study—and has a Wall Street Journal article to prove it.

by Chris McManus '91
Brown Is New Leader of Apple Breeding Program

Dr. Susan Brown, assistant professor of pomology in the Department of Horticultural Sciences, is the new leader of the apple breeding program at Cornell's New York State Agricultural Experiment Station in Geneva.

“Susan is the best qualified person to assume the major responsibilities for one of our most important breeding and evaluation programs,” commented Dr. Robert Anderson, professor of pomology. Anderson will assume Brown's previous responsibilities at the Station, which were to breed tart cherries and to evaluate sweet cherries, peaches and apricots.

Brown plans to combine classical breeding techniques with molecular approaches toward the development of improved apple varieties. “These new varieties,” she said, “must have horticultural characteristics that are equal to or better than those existent in present varieties.”

Dillard Promoted to Associate Professor

Dr. Helene R. Dillard, a plant pathologist at Cornell's New York State Agricultural Experiment Station in Geneva, has been promoted to associate professor of plant pathology.

Her interests include epidemiology, the study of how diseases spread, and the development of accurate, reliable forecasts for vegetable diseases. In accordance with these interests, Dillard's research at Geneva has focused on the biology, ecology, and control of fungal diseases of processing vegetables.

Since joining the Station in February of 1984 as an assistant professor, Dillard has done research on white mold and black rot of cabbage, anthracnose on tomatoes and dry beans, rust and northern leaf blight on sweet corn, and fungal induced blemishes in sugar snap peas and lima beans.

In addition to research, Dillard runs an extension program which emphasizes the cultural and chemical practices that reduce disease incidence and severity. As part of this program, she attends grower meetings regularly to explain the results of her research and to provide suggestions for disease control using integrated pest management techniques. As a result, Dillard has developed excellent rapport with growers and the vegetable industry.

Entomology Expert Promoted to Professor

Dr. Richard W. Weires Jr., recognized as a world authority on the various kinds of leafrollers that attack fruit, has been promoted to the position of professor of entomology at the New York State Agricultural Experiment Station's Hudson Valley Laboratory in Highland. Weires joined the Laboratory in 1974 as a research associate.

Promoted to assistant professor of entomology in 1975, Weires was well-known for informing fruit growers of insect and mite problems and recommending ways of solving them. He has researched ways of developing integrated pest management control measures for pests that attack fruit crops. Since 1975, Weires has continued his research and extension to reduce pest populations on fruit crops in eastern New York. He has published more than 100 papers discussing problems directly related to insects and mites in this same area.

Currently, Weires works on projects with entomologists at the Geneva Experiment Station. One such project involved devising strategies to delay the development of resistance of spider mites to pesticides.

What About Waste

"What about Waste?" is a new Cornell Cooperative Extension publication designed to introduce youth to facts about the environment, its resources and waste. The authors provide background information on solid waste and discussion questions with possible answers, to help the group get started on projects to identify what can and should be reduced, reused, recycled and composted. "What about Waste?" is available from the Cornell University Distribution Center and from Cornell Cooperative Extension offices around New York state.

Trancik Elected to National Landscape Society

Roger T. Trancik, professor of landscape architecture and city and regional planning, has been elected to the National Fellows of the Society of Landscape Architecture. Only twelve others were elected to the Society this year, which was established in 1898 and has a total of 175 members.
AS FUEL PRICES RISE, MORE PEOPLE may take advantage of an alternative to motor vehicles—bicycles. Saving gas and decreasing the numbers of cars on the roads is admirable, and so is being a bicyclist who knows and obeys the law. Unfortunately bicycles can be a nuisance when riders do not follow the law and the rules of common sense.

"Bicycles are an integral part of the transportation system," said Lois Chaplin MPS '88. Chaplin is an extension associate in the Department of Agricultural and Biological Engineering, and a member of the newly formed Cornell Ad Hoc Committee on Bicycles. Chaplin, who is a bicyclist, develops methods of educating children on how to be better bicyclists. "Bikers need to be predictable and to behave in a manner that is predictable. Be smart. Wear a helmet and behave like a vehicle in traffic. Be aware. Be seen. Wear light-colored clothing," she said.

Towns and cities face the same problems with bicycles that are seen on the Cornell campus. Cornell does not have a policy specifically for bicycles. "Cornell streets are covered by New York state traffic laws," said George Sutfin, patrol officer in the Department of Public Safety, Crime Prevention Unit. Bicyclists in New York state must obey traffic lights and signs, yield to pedestrians, ride on the correct side of the road and in a bicycle lane if one is available, according to the pamphlet, Sharing the Road, developed by members of the Statewide Bicycle Advisory Council. Violators can receive traffic tickets.

The city of Ithaca has an ordinance which prohibits riding bicycles on sidewalks, including those on campus. "Public Safety officers, by law, cannot enforce the ordinance at Cornell; however, cyclists can be referred to the campus judicial administrator," Sutfin said. The ad hoc committee will be reviewing the situation in the next few months and will make recommendations on where cyclists should be.

Bikers cannot expect pedestrians to watch for and avoid them, and pedestrians cannot always predict what cyclists will do. "Get bicyclists who are dealing with pedestrians to take some tips," Chaplin said. She suggested bikers keep their speed down, and calmly warn pedestrians of their presence when cycling up behind them. "They've all been pedestrians too," she said. Motorists can help by making the road a safer and more inviting place to ride. Bikers have a right to be on the road; according to New York state law, "... any driver of a vehicle shall exercise due care to avoid colliding with any bicyclist."

Bicycle parking is a problem when bikers use hand railings, trees, benches, fire exits, and fences as substitute bike racks. Complaints arise, and complaints prompt action. A news brief in the October 4, 1990 issue of the Cornell Chronicle said, "Life Safety Services will impound all bicycles stored or placed in any means of egress—stairs, corridors, fire escapes, etc.—placed in danger to the public. Locks and chains will be cut at the owner's expense."

Chaplin suggested that town and city planners begin planning bike racks in areas of need. The ad hoc committee plans to inventory the numbers and locations of campus bike racks. "No one has put any thought into where these racks should be," Chaplin said.

According to Marc Kratzschmar MRP '90, assistant transportation planner in the Office of Transportation Services, "The Campus Planning Office has been asked by Ken Wing [54, associate dean of the College of Agriculture and Life Sciences] to provide bike parking where Roberts was knocked down." A proposal of sites on the quad for bike parking will be submitted to Dean Wing soon.

The few make problems for the many when bikers behave thoughtlessly. Some bikers ride down handicapped-access ramps, such as the one at Roberts Hall, and bicycles are often found chained along the ramp's handrails. "When other bikers ride irresponsibly it's frustrating as a complying cyclist. It shoots down the reputation of cyclists," Chaplin said.

Bicycles are not permitted in campus buildings, but a walk through some buildings around the ag quad showed people ignoring that rule. In corridors, dirty tire tracks make extra work for custodial staff. Bikes were observed in offices and labs where colleagues and custodians have to work around them.

What are some solutions to the problems? "We need a lot more public information out there," Chaplin said. She suggested the four E's—encouraging good riding habits, education, enforcing law, and using engineering to provide bike lanes and parking racks.

Biking is fun, economical and good exercise. With more knowledge, courtesy and common sense, problems can be minimized, if not eliminated.

by Janis Strope '86

New York State College of Agriculture and Life Sciences, a Statutory College of the State University, at Cornell University
Advances in the Ag College
About the Issue

This issue of the Countryman focuses on various types of research being done in the College of Agriculture and Life Sciences. Learn about advances in the study of bees, naked mole-rats, alfalfa, whey, and the war on pests. The Countryman also looks at strawberries, weather folklore, and some of the ag college's best and brightest people.

What's in a name? The Countryman staff has been struggling with that question. See the article on page 3 for the debate over whether our name is sexist or generic, a time-honored tradition or a stubborn throwback. The point here is that we want your opinion! Should the name of this magazine change? The editorial staff urges our readers to send us their comments and suggestions.

Correction:

Our November 1990 article, “How Everett Stiles Got to Cornell,” was based on an article written by Frank W. Williams, who submitted it to the Countryman. This information was inadvertently omitted in an editorial change. Our apologies.

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SALESMAN BECAME SALE ASSOCIATE, salesperson, sales agent, solicitor or sales representative. Fireman became fire fighter. Milkman became milk deliverer. Should the Cornell Countryman become something else?

In the fall of 1990, the Countryman staff raised the issue of renaming the Countryman because the name may be sexist. The magazine is produced by undergraduates students in Print Media Laboratory. Each class produces three issues before leaving the responsibility to next semester's students. The frequent change of staff makes it difficult to go through with a project as huge as renaming the Cornell Countryman, but as we do feel responsible for "our" three issues, we decided to at least raise the question.

The question has three parts. First, is "countryman" a sexist word? Second, if so, is this important enough to abandon the Cornell Countryman tradition and reputation? Third, who "owns" the Countryman and can thereby make a final decision?

Sally McConnell-Ginet, professor of linguistics at Cornell and author, co-author and editor of several articles and a book on sexist language, said sexist connotations depend on the context. "If you personify and speak of the countryman and his wife, yes, it is sexist," said McConnell-Ginet. She distinguishes between the word "man," which refers to a male, and a word that contains the suffix "man," which may or may not refer to both sexes.

"The suffix -man used to refer to all citizens, but in many cases, women were not considered citizens. Men's perspectives on the world have dominated and shaped the discourse, and today it gets harder and harder to include everyone in the 'man' suffix. For many, it is too closely linked to the independent 'man,'" she continued. "Language does change."

"Many things may be sexist of origin but can still be used in a non-sexist way. If current people don't make the connection, the word isn't really sexist any more. In contrast, words like 'man' were once neutral but are not any longer," said McConnell-Ginet. She feels the original meaning of a word is much less important than its current connotation; "countryman" is a borderline case.

"Although the name is not unproblematically gender-neutral, it has the virtue of being alliterative, and it conjures up an image of a bygone era. Featuring female countryfolk in the magazine and generally using inclusive language in the articles may be more important than changing the name on the cover," McConnell-Ginet concluded.

Renaming the Countryman implies abandoning one of the magazine's longstanding traditions. Jane E. Hardy '53, advisor to the Countryman and instructor of Print Media Laboratory, has been responsible for the magazine since 1975. "The Countryman is the oldest land-grant university magazine published by students in the U.S. and has not missed an issue since the start in 1903," Hardy said. "I am very concerned with biased language, but I don't think we should rewrite the English language to satisfy the needs of some. I can't see rewriting history."

Language has become a symbol of attitudes, but adjusting the language may not, however, alter the attitude. "We clearly need to get rid of some words, but I don't feel that 'countryman' is on top of the list," said Hardy. "Besides, what would the new name be? Cornell Countryperson takes away the nostalgia and 'countryperson' isn't an accepted word. Cornell Country eliminates the specific reference to people in the College of Agriculture and Life Science.'

Who can decide on the Countryman's future? The College covers expenses for which the subscription fees don't provide, just as it pays for laboratory equipment for other courses. Does this mean that the college administration should decide on the magazine's title? Could a single semester's class decide, or should the teacher of the course determine the outcome of the controversy?

We don't have answers to these questions yet, so no radical changes can be made now. However, the staff has decided to introduce an explanatory line under the title on the front cover and a statement on page two. Both will appear in each issue from now on, unless future semesters' staffs choose to remove them.
THE PEST PATROL IS ON THE MARCH in Ithaca. Cornell University researchers are leading the campaign to design new methods of controlling plant pests, methods which will probably surprise you. Scientists' latest weapons in the war on pests include worms that seek out insects like guided missiles, killer wasps, and a beetle-killing flame thrower designed to put the heat on crop destroyers.

Three hundred researchers and extension specialists gathered in Ithaca in November 1990 to discuss pest control at the 52nd annual New York State Pest Management Conference. Sponsored by Cornell's College of Agriculture and Life Sciences and by the New York State Agricultural Experiment Station, the conference showcased the latest advances in the field of integrated pest management.

"A good working definition of integrated pest management is the integration of cultural, biological, and chemical methods of controlling pests," explained Department of Entomology research associate Chris Geden. Geden said the 20-year-old field is concerned with fighting insects and other pests which destroy crops, lawns and gardens with as little chemical use as possible.

The use of bio-insecticides—living creatures which can do the work of chemical pesticides—was the topic of a speech given by assistant professor of soil insect ecology Michael Villani. Villani discussed using microscopic worms called parasitic nematodes to control Japanese beetles, which cause millions of dollars of damage to farms and lawns.

"Basically, you can think of them as microscopic hypodermic needles," Villani explained. The worms, he said, carry a toxin-producing bacteria. When Japanese beetles take over an area of soil, farmers or groundskeepers send a battalion of the nematodes into the ground.

Like all well-trained soldiers, the nematodes tirelessly seek out the enemy. Once they find an immature beetle, called a grub, the worms burrow into its body and then literally do their work from inside enemy lines. The toxin produced by the bacteria in the nematodes quickly kills the grub. The nematodes, along with the bacteria they carry, continue living and multiplying inside the dying insect. "After a few weeks, you have hundreds of thousands of nematodes in the grub," said Villani. "The grubs burst and the nematodes go after new beetles."

Villani said just how the nematodes track down the grubs isn't known. One possibility, he suggested, is that the worms home in on carbon dioxide or other wastes produced by the beetles. No matter what the cause, Villani said the effect is impressive. "It's a really beautiful system. It's as if you've got a guided missile."

Villani's research has shown potential for great success with the use of parasitic nematodes. The worms consistently performed well in the field. But, while optimistic, he shied away from predicting the worms would eventually replace pesticide use altogether. A big factor, Villani said, will be the future performance of nematodes in the field. "That's the big 'if.' That's the $100,000 question."

But while there are many questions facing the developers of new pest control systems, there are also questions for those continuing to use chemical controls. One of the biggest problems is resistance. Plant growers are finding that pests are acquiring immunity to the traditional chemical controls. The situation has sent researchers back to the drawing board in the hope of coming up with new strategies to fight the pests.

That most well-known of pests, the fly, is no exception to the phenomenon of resistance. Geden spoke at the conference about battling houseflies and stable flies on New York state dairy farms. Immune to many traditional chemical controls, the flies are more than just a nuisance. Houseflies spread diseases among cattle and humans and stable flies actually cause physical pain to animals, Geden said.

In an attempt to control the flies, Chris Geden has enlisted the forces of an insect air force—the killer wasps. "These wasps are specialized," Geden said. "They live to do only one thing—attack and parasitize fly pupae. The pupae are the cocoon-like stages from which adult flies emerge. The wasps track down these fly pupae (here again, the method of tracking is not well understood), kill the young flies with their sting and lay their own eggs in the cocoons. There's no danger from the wasps, Geden said, because the same specialization which makes the wasps so successful in fly control also keeps them from harming humans or animals.

A fly killed by one of Chris Geden's fungal diseases explodes, showering the surrounding area with spores that produce more of the deadly fungus.
But the wasps also face many obstacles which researchers have been trying to define and eliminate, Geden added. Problems for the wasps include pesticide spraying, which kills them off just as effectively as it kills the flies, and poor manure management on the part of farmers which leads to a fly population explosion.

"It's sort of an arms race between the fly and the wasp," Geden said. "The fly gets through its life cycle in approximately two weeks. The wasp requires three or four. Unless you try to level the playing field a little bit, the fly always has the advantage."

Geden has also experimented with a fly-killing fungus. The fungus infects a fly and causes a curious change in the insect's behavior. Just before dying, the fly climbs to the highest object in the area and attaches itself. Shortly after death, it bursts open, showering the surrounding area with spores which become new fungi.

While Villani and Geden have called out the ground and air troops to fight plant-destroying insects, potato and vegetable specialist Dale Moyer is rolling out the heavy artillery. Moyer, an extension agent at Cornell's Cooperative Extension office in Suffolk County, New York, spoke at the conference about a new device he is helping to test—a beetle-killing flame thrower.

The device operates on potato farms against crop-eating Colorado potato beetles. "It's not a real complicated piece of equipment," Moyer said of the fire-breather, which his research group calls the propane flamer. "It's something you wouldn't think would work, but it seems to do the job."

The flamer is a 12-foot-long boom which is mounted on the front of a tractor. On the boom, attached at three-foot intervals, are four pairs of propane burners. Affixed to the back of the tractor is the flamer's fuel source—a 250 gallon propane tank.

The flamer chugs along over young potato plants at speeds of three to four miles per hour and performs the astounding feat of killing potato beetles while not harming potato plants. "It's hard to comprehend," Moyer admitted. "But there's a certain heat that the plants can tolerate and the beetles can't."

Moyer's flame thrower performed well on the Long Island farm where it was tested. The propane flamer controlled 80 percent of the potato beetle problems on the farm, much better than the 20 to 50 percent control usually provided by chemical pesticides. According to Moyer, an effective propane flamer could increase yields and decrease pesticide use. That could translate into a yearly savings of $500,000 for the New York potato farming community, he said.

While Moyer's flamer is nearly ready for commercial use, Geden and Villani cautioned that their research is years away from completion and all three scientists warned against ironclad statements about the demise of pesticides or the rise of alternative pest control methods.

"It's going to take three or four years before we know why some things are working and why some aren't," said Villani. Geden agreed that change won't come overnight. "You're going to ultimately run into situations where pests just get out of hand. For the foreseeable future, insecticides will remain a component of integrated pest management."

by Alex J. Nussbaum '92

The University's cooperative extension agents in Suffolk County, New York, are testing a vehicle called the propane flamer. The fire-breathing machine kills potato beetles while saving the plants.
Exporting Education

EACH YEAR MANY INTERNATIONAL students come to Cornell University seeking the education or experience they cannot get at home. Although some decide to stay in the U.S. after they complete their studies at Cornell, many take what they have learned back home or to other countries.

Animal science graduate student Isabella Urbina, from Costa Rica, has decided to apply the findings from her research to agriculture at home. "I am using computers to develop nutrition management strategies for cattle," she said. With her IBM PS/2 she simulated a cow of a specified size and weight that would produce the most milk and be most economical to farmers in tropical regions. Since diet and general health determine the growth and size of a cow, Urbina has also figured out the best diet for these cows.

Urbina conducted her research using data about the climate and environment in Costa Rica and other tropical regions. Apparently, the grass the cows graze on in Costa Rica is low in nutrition. "Poor nutrition is one reason why something like bovine growth hormone (BGH) will not work in Costa Rica. No matter what hormone you inject into the cows," she said, "they won't produce more milk unless they have something to convert into milk."

Urbina will return to Costa Rica in the spring of 1991, taking her knowledge and skills with her. "I want to go out and tell the farmers what their possibilities are and what I think would work best for them," she said. Urbina plans to get a consulting job in Costa Rica in an institution such as the University of Costa Rica, the Agency for International Development, the FAO or the World Bank.

Not all international students are as sure as Urbina as to what they will apply their studies to after they graduate from Cornell, however. Food science graduate student Salome Papaspyrou, from Greece, is studying food science with a minor in biochemistry.

Papaspyrou is not sure if she will take her studies back to Greece. "If I go home," she said, "I would want to apply my background to academics by taking a teaching position at a Greek university."

If she chooses not to return to Greece, Papaspyrou said, "I will focus my attention toward the study of international nutrition with a concentration on energy and protein malnutrition among children in developing countries. I hope to do additional research and field work by visiting various countries to analyze the existing situation."

If she pursues this option, Papaspyrou wants to work in India or in another developing country.

Another food science graduate student, Jacobo Fastag, from Mexico, is studying food engineering, concentrating on the thermal processing of cans. He works with pilot plant-size retorts which commercially sterilize cans. "All the heating regimes we use can substantially reduce the population of microorganisms, but the difference lies in the time it takes, the amount of steam consumed and the degree of nutrient destruction in the food."

By using a computerized mathematical method called "nonlinear trajectory optimization" Fastag tries to find the best way to heat the cans in the shortest time and with the least amount of steam consumption and nutrient destruction.

Fastag doesn't know if he will go back to Mexico right away. He wants to first look for a job in the food industry in the U.S. "By staying in the U.S.," he said, "I will gain valuable working experience and perhaps my prospective employer will operate internationally."

Fastag would be willing to return to Mexico to be the company representative.

When these international students complete their educations, they will enter the workforce. Each student has had an opportunity to develop his or her skills and knowledge while studying at Cornell and will be ready to apply what they have learned to the challenges they choose to take, whether they decide to reside in the States or in their own country.

by Christina Yee '92
More than Dibble Sticks

TO SOMEONE WHO GREW UP IN A rural area, a dibble stick might obviously refer to a pointed tool used to make holes in soil for seed planting.

To someone who grew up in an urban area, however, a dibble stick might mean ... nothing.

Those who want to learn about such hand tools and farm machinery can do so through a book called Dibble Sticks, Donkeys, and Diesels: Machines in Crop Production. Author Joseph K. Campbell, a professor in the Department of Agricultural and Biological Engineering in the College of Agriculture and Life Sciences, and a farm implements expert, wrote the book to clarify farm mechanization for the lay person.

"I teach an undergraduate course here in farm machinery," Campbell said. "My students are often new to the material and come in to ask me about different machines. This book should help them." Campbell also wrote the book to help planners in developing countries who may not be familiar with different farm technologies. Campbell meets many such planners in his travels as advisor and consultant to organizations and governments around the world in places such as Bangladesh and Indonesia. "Every year, I take at least one four- to six-week trip—usually to Third World countries—and work with people in developing countries who frequently don't know much about farm machinery," Campbell explained. "These people need appropriate machinery to cultivate the land, and cannot afford to waste money on too many

by Betty Ng '91

efforts in finding the 'best' machinery for their agriculture.'

The major problem, according to Campbell, is that farmers often inappropriately try to use farm machines used in other countries. "Often, farmers in developing countries try to use machines for which there is no training for operation or maintenance support," Campbell said. "For example, in the United States, practically all cotton is picked by machines. When farmers in Ghana tried to use such cotton pickers, however, they encountered many difficulties. In order for these machines to work, the fields must be smooth, and desiccants must be used to dry the leaves first. The farmers in Ghana just did not have this technology—they had only part of the system."

Thus, certain changes are necessary before moving from one system of technology to another. "Farm machinery and tools have to be adapted to fit the local system of agriculture," Campbell emphasized. "What works in one part of a country may not work in another part of the same country."

Though this adaptation problem often arises in foreign lands, it also exists in the United States. In fact, the problem occurs locally. "Some farmers here in New York state use large round balers [for hay] developed for use in the western states to bale hay rapidly," Campbell said. "Unfortunately, many of these farmers are then trying to fit large round bales into barns designed for small rectangular bales."

Although Campbell's book covers machinery and mechanical power, it also discusses draft animals, such as horses and oxen. Campbell writes: "'Draft' is a suitable term for animals used in agriculture, for the animal's strength is nearly always converted to useful work by the animal pulling against a load."

According to Campbell, animals and machinery complement each other functionally on a farm. "Basically, we're talking about using draft animals versus using tractors," Campbell said. "In most countries, the tractor is used for heavy work like tillage, and animals are often used for lighter work."

Campbell does not advocate one over the other, since both have advantages and disadvantages. "The tractor is mechanical and can be used around the clock, whereas the animal needs to rest," Campbell said. "On the other hand, animal power does not demand money outlays. You don't exchange cash for animals because you can raise that power yourself."

This factor is important, Campbell said, because most farmers try to cut costs when possible. For example, Campbell pointed out, farmers in Third World countries often use a barter-type system, because many of them may just not have cash to buy diesel fuel to power their machines.

Campbell's book is not expensive, especially in Third World countries. "I didn't write the book to profit from it," Campbell said. "Though the book costs about $20 here, it costs less than five [dollars] in the Third World. That is not expensive for government planners who may need the book, which also explains the trade-offs in using different tools and machinery."

Thus, the diversity of the book explains its title. "Originally, the title was Field Machinery," Campbell recalled. "What a dull-sounding name! Also, this book contains information not only on machinery, but on factors that determine which machinery to use and different ways to use them as well. Even transportation of farm produce is discussed."

"The book is more than just machines and dibble sticks."
A FOREST OF

THERE IS MORE TO CORNELL THAN the campus on the hill above Cayuga Lake. Twenty miles southwest are 4,025 acres of forests, fields, streams and ponds dedicated to teaching, research and demonstration. These lands are the Arnot Teaching and Research Forest, administered by the Department of Natural Resources in the College of Agriculture and Life Sciences.

The forest provides a unique setting for teaching and research. "People are able to do research on a managed area. Because it was extensively logged and burned over about 100 years ago, it is representative of woodlands in upstate New York," said Donald Schaufler, forest manager for the past six years.

A Cornell Cooperative Extension bulletin, "The Arnot Forest: A Natural Resources Research and Teaching Area" describes the forest's history: before European contact, the Seneca people hunted in the area. In 1606, King James I of England gave the land to the Plymouth Company, and for the next 100 years few Europeans came into the area. After a territorial dispute, a 1754 treaty signed in Paris gave the land to the British. The Senecas were driven out. After the American Revolution, New York state gained title to the land, and sold it to citizens. The forest was bought by John Rodbourn, who cut and shipped its timber to the east. Rodbourn mortgaged 1,641 acres during a recession, and lost it to foreclosure in 1910. In 1914 the estate of Matthias H. Arnot bought the land.

At that time, according to the bulletin, the Department of Forestry at Cornell recognized a need for a demonstration and experimental forest. "The executors of the Arnot estate wanted to sell the forest, but the University had no money to buy it. . . . In 1926, the heirs of the Arnot estate gave the land to the University." Cornell bought 292 acres of adjacent land and another 2,092 acres was deeded by the federal government in the 1950s, bringing the total to 4,025 acres.

What is Arnot used for? "Support of research and teaching is the highest priority, followed closely by the obligation we sense to manage forest resources to the best of our ability," said Professor John W. Kelley PhD '68, director of the Arnot Forest since 1985. Before Kelley took over, no extensive forest management had been done.

In 1985 Kelley and Schaufler divided the forest into six compartments of 57 identifiable forest stands, then inventoried the timber. The forest was proved to be overstocked and in need of thinning.

Large portions of the forest are American beech. Beech bark disease is moving through New York forests, and the older infected trees are dying. "Beech stands are thinned and trees removed while they still have value. Trees are sold 'on the stump' (standing) to mills and loggers," Schaufler said. He marks the trees and supervises their removal. Healthy and more desirable trees are left and allowed to grow. In 10 to 15 years when the next thinning is planned, the value of the timber will have risen. Income from timber and firewood sales is being used to maintain the forest. It is hoped that income generated can be used to further fund student research and internships. Current research projects at the forest include a 60-acre project on the beech bark disease, and work comparing pear thrips damage on trees to the number of thrips in the soil. Schaufler hopes to inventory the ponds and smaller vegetation of the forest complex. Providing details on these areas could stimulate research.

"We are concerned with the quality of the next forest," Kelley said. Schaufler added, "We are working in areas not set aside for teaching and research to put into practice the scientific forest management programs Cornell has been recommending to woodlot managers and owners. We hope Arnot can serve as an example of how forestry techniques can be applied to forest lands."
POSSIBILITIES

Woodlot owners are often reluctant to practice forestry management for fear of disturbing the wildlife population. “Good forestry is also good wildlife management,” Kelley said. Since thinning began at the Arnot, wildlife populations have increased as room is made for shrubs and young trees, which provide food for animals.

In the northeast corner of the forest, three self-guided tours of managed stands have been set up using funds from the Ruffed Grouse Society. These stands demonstrate the compatibility of timber management and wildlife management.

One third of each year is devoted to the sugarbush—producing maple syrup from the sugar maples in part of the forest. The syrup is wholesaled to Cornell’s Dairy Store and orchards for retail sale. Approximately 1,800 taps are installed annually and 500 to 600 gallons of syrup produced. Schaufler helps with “Maple Syrup Production,” a course taught by Kelley. “Woodlot Management” and “Forest Ecology” have also been taught at the forest.

The Arnot staff includes Schaufler, one field assistant and a caretaker who lives on the grounds. The field campus area includes cabins and a main lodge. The buildings have been used since the 1940s for 4-H conservation education camps, and until last year, an annual summer camp was held for outstanding 4-Hers. The New York State Department of Environmental Conservation has also used Arnot for conservation education training camps. Cooperative Extension has held short courses and education programs for agents at Arnot. Unfortunately, liability issues and insurance costs have now forced cutbacks in the use of Arnot by outside groups.

The Civilian Conservation Corps used the camp from 1933-1937 to provide jobs during the Depression era. CCC workers built bridges, surveyed boundaries, did a topographic survey, improved forest stands and stream beds, planted trees, built fire breaks, erected gates and constructed truck, foot and horse trails. The forestry department’s annual report for 1933-1934 said “It is doubtful if the engineering projects could under our ordinary circumstances have been completed in less than 20 to 25 years.”

Conservation was not the only use of Arnot by the government. “In World War II the federal government requested the use of the CCC camp buildings to house 50 prisoners of war. But they had just arrived when victory was won in Europe and the prisoners were repatriated,” according to the Cooperative Extension bulletin.

Arnot not only has an unusual history, it has an unusual feature—a totem pole—which stands behind the main lodge. According to the bulletin, “The totem pole was carved by the Salmon-Eaters, a clan of Tlingit Indians who lived along the coast of southeastern Alaska. . . . This pole, which is very old, was removed from Cape Fox near the Alaska-Canada border by the Harriman Expedition which visited Alaska in 1889. The pole was first erected on the [Cornell] campus . . . where it stood for more than 20 years. In 1934 it was erected in the Arnot Forest.” Fourteen feet have been cut from the pole and it is becoming hollow and worn from the elements. Schaufler has tried unsuccessfully to find someone interested in preserving it.

The forest is open to the public for cross country skiing, hiking, picnics and other daytime uses. Hunting is allowed by permit. Hunters are asked to keep a journal detailing the extent of their hunting effort, what is taken and what animals they saw.

Arnot Forest offers natural beauty, peaceful surroundings, an abundance of wildlife and possibilities for learning about woodlands that could help preserve the greatest resource—the land.

by Janis Strope ’86

Teachers and sportsmen’s workshops were held at the camp during the 1960s and 1970s. The buildings have also been rented to Cornell groups for retreats and planning sessions.
**ABANDONING SUNNY CALIFORNIA** for not-so-sunny Ithaca cannot be an easy thing to do. But Dr. James Affolter was not about to pass up the opportunities that awaited him 3,000 miles away. Besides, gray skies alone could not have prevented this Syracuse native from choosing to be an integral part of shaping the beauty of the Cornell campus.

As the new director of the Cornell Plantations, Affolter is able to do just that—and add his own special touch as well. After having spent seven years as curator of the botanical gardens at the University of California at Berkeley, Affolter took over as director of the Plantations in June 1990, replacing acting director Carl Gortzig. Gortzig, a professor in the Department of Floriculture and Ornamental Horticulture, had directed the Plantations on an interim basis for a year and a half. Meanwhile, the University searched for someone to permanently replace former director Robert Cook, who now supervises the Arnold Arboretum at Harvard University.

In choosing Affolter, Cornell could not have found someone who knows his plants any better. Affolter was educated in plant taxonomy and received his PhD from the University of Michigan. But what was it that beckoned him away from Berkeley? “Cornell is a great university with an excellent program in plant science. I’m interested in how we can use the botanical gardens here for research and education, particularly with respect to conservation of our environment.”

Affolter said he was also attracted to Cornell because of the unique combination of areas run by the Plantations. In addition to the botanical gardens and the F.R. Newman Arboretum, the Plantations also maintains over 2,000 acres of the natural areas in Tompkins County, including the gorges and Bebe Lake. Affolter would like to add to the natural areas, which he sees as prime places to study rare species and practice ecological and conservation techniques.

Affolter also said that although other universities have areas similar to the Cornell Plantations, many of those areas are located several miles from central campus and often go overlooked by the university. “The fact that it [the Plantations] is contiguous gives us the opportunity to play a more active role in the University,” he said.

Affolter sees the Plantations as an important bridge between the college of agriculture and the general public. He believes that plants can serve as a ‘springboard for discussion’ and can thus educate people in other areas.

While at Berkeley, for example, Affolter invested much of his time in his pet project—a garden which featured Chinese medicinal herbs. “There are a lot of lessons we can learn about Western medicine by studying Chinese medicine,” he said. The garden prompted discussion about how to incorporate some of the Chinese ideas into our own theories of medicine and healing. Affolter also spent six weeks in China learning first hand about healing techniques using plants—a popular concept in Chinese culture.

Affolter would like to develop other types of gardens which can educate in addition to providing aesthetic appeal. Whereas the Plantations has focused mainly on ornamental horticulture in the past, Affolter would like to expand on more specialized collections here, such as the Heritage Garden Collection. This garden features plant varieties from more than one hundred years ago and is an excellent example of man’s influence on plants. Affolter sees such a garden inspiring interest in topics such as evolution and ecology.

Several classes in the ag college currently use the Plantations for some of their laboratory classes. But Affolter said the Plantations’ leaders will need to take the initiative to encourage even more classes to explore the natural areas around Cornell.

Affolter, however, realizes education is not the only purpose of the Plantations. The beauty of the gardens and gorges cannot be denied, and the scenery can serve as a place to reduce stress and forget troubles. “One of the most important functions of the Plantations is to be a place where people can come and take a five- or ten-minute walk and just relax,” he said. “It’s a sad fact that many students go through four years here without realizing all the Plantations has to offer.”

With his tremendous background in the world of plants, new educational ideas, and concern for ecology, it is obvious that Affolter has a lot to offer Cornell as well.
FOR CENTURIES, PEOPLE HAVE ASKED, what’s the weather going to be like tomorrow? Nowadays people turn on the television to see the latest forecast. What about checking cobwebs on the front lawn or cutting up an onion on New Year’s Day? Are these off-the-wall ideas, or do they actually predict the coming weather?

According to the 1991 Ithaca weather calendar, people still have trouble forecasting the weather. Though databases, computers and satellites now aid meteorologists in observing the weather, many legends from centuries ago still persist. Weather folklore is the theme of this year’s weather calendar.

One piece of folklore which deals with predicting the weather for the upcoming year involves the use of an onion. According to Duncan Emrich’s book `Folklore on the American Land,’ on New Year’s Eve, follow this procedure: cut an onion down the middle and remove 12 half onion shells, for each of the 12 months of the year. Place one teaspoonful of salt on each shell. At 6:00 a.m. on New Year’s Day, according to Emrich, read the forecast for the year as follows: if the salt is moist, that particular month will be wet. Meteorologically speaking, this theory has to be taken with a grain of salt.

Why does such folklore persist? Meteorologist Mark Wysocki, MS ‘89, an instructor in the Department of Soil, Crop and Atmospheric Sciences and co-editor of the weather calendar, offered several reasons. According to Wysocki, when meteorologists can’t predict weather flawlessly, people fall back on folklore and often challenge scientists to prove the legends wrong. Wysocki added that people assume “If it worked for our forefathers, it should work for us.” Another reason folklore persists, according to Wysocki, is the belief that “some unknown force is out there controlling the weather.” Some people believe animals and plants are in contact with this force.

One of the most popular myths surrounds the groundhog. Every year on February 2, people wait for this animal to emerge from its hole. Legend has it that if the groundhog sees its shadow, winter will be around for six more weeks. Rarely do people follow up on the furry creature’s “prediction.” Groundhog Day is a popular media event, not a very good forecasting tool.

How about the familiar adage “April showers bring May flowers”? According to Wysocki, things “happen to work out that way.” He said that in the northeast, this saying has some validity; during April and May, winter officially ends, the ground thaws and plants blossom.

Even fruits and other crops are used to predict weather. According to the calendar, one unfounded legend is that tough apple skins forecast a hard winter. But Wysocki noted that tough skins form in response to conditions during the summer, such as a lack of rain or nutrients. The adage persists because it seems to make sense—thick skins insulate the plants from a cold winter.

While many are just tall tales, some ancient legends are, according to the calendar, “meteorologically valid.” For example, when a halo is present around the moon, the weather will be wet and rough. The weather calendar explains that cirrus clouds, which are responsible for these halos, are forerunners of storm systems. A storm generally approaches within 24 hours.

According to Emrich, farmers believe that cobwebs on the grass are a sign of fair weather and that “when dew is on the grass, rain will come to pass.” Emrich explained that both items are true. He wrote that cobwebs can be seen on the grass only when covered with dew. Since two perfect conditions—a windless and cloudless night—create the dew, Emrich concluded that fine weather will continue for at least a day or more.

Another good forecaster is the cricket, an animal the weather calendar calls “a poor man’s thermometer.” According to the calendar, scientific experiments show that the number of chirps in a 14-second period, plus 40, is the air temperature within one degree Fahrenheit.

Intrigued? One of the more interesting pieces of unfounded folklore in the calendar is that the date of the first snowfall in November tells the number of snowstorms for the entire winter ahead. For example, if the first snow falls on November 12, as it did in Ithaca this year, 12 snowstorms will occur for the rest of the winter months. Wysocki challenged readers to test the theory this winter and in future winters.

The weather calendar encourages people to test out these theories and their own folklore as well. Readers have already written to Wysocki with new folklore. Experiments may prove some of these new folklores to be valid.

The 1991 Ithaca weather calendar is available from 1113A Bradfield Hall, Ithaca, NY 14853. The price is $6.00.

by Jeffrey S. Popow ’91
The naked mole-rat is a virtually hairless mammal about three inches in length. This average coefficient was found to be extremely high. While a mother and her child, which share half their genes, have a relatedness of .50, results of the study show that members of a naked mole-rat colony, on the average, have a relatedness of .81 (+.10). "It is the highest coefficient of relatedness of any mammal in nature we know of," said Sherman.

But how does this relate to altruism, or more specifically, reproductive altruism? For years scientists have been struggling to explain altruistic behavior in light of Darwin’s hypothesis of evolution by natural selection. Reproductive altruism, the behavior exhibited when an individual forsakes its personal reproduction to help others reproduce, seemingly contradicts Darwin’s reasoning that an individual's primary reproductive interests are its own. According to Darwin, individuals should strive to reproduce and will naturally compete to do so.

But, naked mole-rats do not follow this model; relatively few individuals mate and reproduce. Only one female per colony ovulates, mates and reproduces, having four or five litters of about 10 young each per year. In fact, the queen behaviorally and chemically prevents other females from ovulating. These females as well as other colony members of both sexes help to feed and protect the queen and her young, which are often their brothers and sisters.

"The puzzle was, why doesn't the individual (naked mole-rat) reproduce?" said Sherman. "Why this extreme form of reproductive altruism?" In order for altruism to "agree" with Darwin's theory, it must be beneficial to the individual's genes in the end.

In the case of the naked mole-rat, it is. Because of its high level of relatedness with other members of its colony, chief editor of a recently published book about naked mole-rats.

For nine years, Sherman has kept colonies of naked mole-rats in clear plastic tunnel systems under dark, humid conditions designed to simulate their underground burrows in nature. To get their results, the researchers tested DNA samples taken from 50 naked mole-rats that died of natural causes.

The DNA samples then underwent a process known as DNA "fingerprinting." According to associate professor of population genetics and development Charles F. Aquadro, in whose lab the genetic work was done, DNA "fingerprinting" is a technique which focuses on the variation in parts of DNA that typically are highly variable. Because of a high rate of mutation, he explained, there will be lots of variation among individuals.

This variation, continued Aquadro, was key to the study; it was the variation between "fingerprints" which was measured to determine the average coefficient or degree of relatedness in a naked mole-rat colony.

SELFISH ALtruism: AT FIRST THOUGHT, the idea seems absurd. But in the case of the naked mole-rat, a three-inch-long hairless mammal from Africa, the concept is not as far-fetched as it sounds. How so? A recent discovery about the genetic relatedness of individuals within colonies of the group-living, highly social, subterranean naked mole-rat, or Heterocephalus glaber, goes a long way in answering this question.

The discovery, the result of a team effort of Cornell behaviorists and geneticists, led by doctoral student H. Kern Reeve reveals that individuals within underground naked mole-rat colonies are nearly genetically identical, that is, almost like clones. The naked mole-rats are as close genetically as laboratory mice, which are the offspring of a brother and sister mated for 60 generations, explained associate professor of neurobiology and behavior Paul W. Sherman, director of the study and

The Altruism

by Maria Politis ’92

The naked mole-rat is a virtually hairless mammal about three inches in length.
a naked mole-rat, in essence, doesn't really need to reproduce personally. Instead, it can perpetuate its genes indirectly by working together with others to insulate that its brothers and sisters (the queen's young) survive.

This reproductive sacrifice is similar to that of some insects, such as termites, ants and some species of bees and wasps, which also cooperate to raise the queen's young. In the latter three groups, sisters are more closely related than are mothers and offspring. "Helping raise siblings is reproductively selfish," said Sherman. In essence, he continued, "it takes the altruism out of altruism." The behavior of the naked mole-rat is comparable in concept, he said, as the individuals are also very closely related.

According to Sherman, this extremely close level of relatedness originally produce on one's own, especially since the queen will suppress her offspring's reproduction attempts.

The same ecological conditions that favor group living promote inbreeding within the colony. Because naked mole-rats stay within their colonies, few if any, foreign males will be present in the colony, and the queen will mate with native males already closely related to her. "There is inbreeding because they're forced into it," said Sherman.

Besides discovering a high level of genetic relatedness among naked mole-rats within a colony, the researchers also found that colonies located within two miles of one another are similar genetically, leading them to believe that nearby groups stem from a common ancestor. "If the tunnel systems are in hard dirt, they can last a long time. So even if a colony has been wiped out by disease, for example, the tunnel system may remain," explained Sherman. If a colony broke their way into tunnels another colony had previously occupied and then isolated themselves, he reasoned, then what appears to be two separate colonies were originally just one. Basically, the fissioning of one colony into two has occurred.

Current and future plans include studying the levels of relatedness among colonies located further apart than previously considered. Aquadro and Sherman hope that further study of the genetic structure of colonies over large geographic regions will provide insight into the ecology and evolution of this remarkable mammal.

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that Isn't

stems from the ecological conditions in which the naked mole-rats live. For example, the species, native to the east African countries of Kenya, Ethiopia and Somalia, live in isolated groups of about 75. What they call home is a vast, intricate tunnel system where members, like the social insects, work together to survive. Smaller, younger naked mole-rats of both sexes will dig the rock-hard tunnels with their prominent teeth, forage for food, build the nest and keep the tunnels clean while larger, older members defend the colony against invaders and predators.

As a result, a naked mole-rat living on its own would have a very tough time surviving. So, most of the time, naked mole-rats stay put in the colony where they were born. "An individual just doesn't leave," said Sherman. "So, what is it going to do? It can't reproduce on its own, but rather through its siblings." If the mother can supply a large number of siblings, continued Sherman, genetically it pays to work toward these siblings' survival rather than try to re-

Associate Professor Paul W. Sherman holds two naked mole-rats in clear plastic tubing such as that in his lab. The tubing is used as an artificial tunnel system for the animals.
**Une Deuxième Langue**

A Second Language

Una Segunda Lengua

by Chris McManus '91

**IMAGINE ATTENDING AN INTERNATIONAL conference on nutrition in the Third World in Mexico City and not understanding a word of what is being said with the exception of uno, dos, tres.** Worse yet, picture finding a study that you need on agricultural techniques in Mozambique or in the Ivory Coast and not being able to read it because you don't understand French.

Languages have separated cultures, even in the area of research, for centuries. Many non-English speaking countries now require all students to learn English to overcome this barrier. Because English has become the universal language, many Americans opt not to study a second language, assuming that they can get by with English. Several professors and graduate students from the College of Agriculture and Life Sciences disagree with this idea.

Professor Cuberto Garza, head of the Division of Nutritional Sciences, stated that Cornell students from every college should learn a second language and added that Spanish is especially useful in the nutrition field. He said that most American students are at a distinct disadvantage because they don't speak a foreign language. "In business it is much more effective to deal with foreigners in their own language."

The nutritional sciences division conducts research in 22 countries throughout Latin America, Africa, Asia and the South Pacific. A second language is especially useful in field work, which often deals with non-professionals, workers or farmers. In most cases students and graduates working abroad would be able to communicate in English with professionals, who have a university education. Few field work subjects, on the other hand, would be able to speak English. Garza himself worked in a pediatric hospital in Mexico. He said that only a few doctors were fluent in English and none of the technical staff were.

Despite obvious advantages to bilingualism, there is no language requirement in the ag college. Coordinator of Student Services Donald Burgett '62, explained that although foreign language proficiency is not necessary for a degree in the ag college, there are no limitations for ag students on language courses offered in other colleges and many students do take advantage of them.

Prof. George J. Posner from the Department of Education stated that he believes the ag college, of all the colleges at Cornell, should have a foreign language requirement. Posner said he believes that Cornell's future is on the international scene. The ag college has strong international ties, through research and projects, with the Third World, he said. Furthermore, the College's interest in agribusiness increasingly requires an understanding of the global economy. "Most of the graduates from Cornell do not go home and take over the family farm anymore," he said.

"Cornell is producing international leaders in agriculture." A second language would be useful for many students who will inevitably deal with non-English speakers.

Graduate student Elizabeth Conlisk '87 spent almost two years in Guatemala, researching the effect of improved childhood nutrition on a person's adult life. She agrees that a foreign language is crucial for students who anticipate any contact with non-English speakers. "In a work setting, you may only be administering a study and may not be in the field. It is still important to be in command of the language to better understand what is going on. Think about how language influences culture and how culture influences language." Conlisk said that speaking Spanish while in Guatemala opened up a new way of thinking for her.

A foreign language may seem more relevant to some areas of study than others. Prof. Richard A. Ledford, PhD '62, chair of the Department of Food Science, said that unlike the nutrition division and rural sociology department, the food science department does not have programs or field studies in the Third World. Still, Ledford strongly encourages all of his advisees to take up a second language at Cornell, especially for students who expect to work abroad or deal with international research topics.

Garza said that French and Spanish are especially important for research in the Third World. Spanish is necessary for Latin America and even Brazil, where it is spoken in addition to Portuguese. French is useful for work in Africa. "I would be equally pleased if all students learned German, Chinese or Japanese, but at least one other language," he said. In fact, Garza even suggests that students try to be trilingual. He added that students who will become increasingly important. Garza said students should make a career choice first and then choose a language.

Burgett said that he doesn't foresee a language requirement for the ag college in the near future. In the meantime, Garza, Posner and numerous other professors are encouraging their students to learn une deuxième langue.
GEROW D. BRILL: Agricultural Missionary

A WESTERN UNION TELEGRAPH SENT to Gerow D. Brill, class of 1888, on July 8, 1897 read, “Government Wuchang to Brill—accepted, come immediate[ly] without assistants.” The cable, which lies in the Brill Collection of Cornell’s archives, had been written by Sidney Partridge—an Episcopal missionary living in Wuchang, China—representing Zhang Zhidong, governor general of Hupei and Hunan provinces. This message would change Brill’s life, for he had been accepted to go to China and become a missionary—one of the first Americans to share western technology with the Chinese. Brill came equipped with the latest knowledge and farming techniques from the Cornell University College of Agriculture.

Brill, at age 33, was chosen for the job of starting China’s first agricultural school and model farm. According to The Stubborn Earth by Randall Stross, Brill’s background included “the latest in academic training and practical agricultural experience, and he was willing to go to China.” Not everyone was willing to go to live in China at that time, for at the century’s turn, China was a country of unrest. A distrust of foreigners plus China’s need to modernize led to widely differing opinions about the future of the country.

A History of the World by Marvin Perry describes the situation: “Although they respected western technology, many Chinese officials still rejected western ideas.” The Chinese feared that westernization would wipe out ancient traditions, and bring on problems of technology, like pollution and unemployment. The people were split on this matter, and provincial or local governments were often left to make the decisions.

Stross says that Zhang of Hupei took a middle-of-the-road stance on the issue: he believed that Chinese tradition should be preserved, but also realized the foolishness of not improving his peoples’ lives with new ideas. He began inviting westerners to bring their knowledge into Hupei. Zhang’s interest in reforms extended beyond agriculture. New ideas in other fields also caught his attention.

At Partridge’s urging, Zhang decreed that an American be sent to Hupei for two or three years to be in charge of teaching students in agriculture. The new school, named the Hupei Agriculture College and Experimental Farm, was founded to introduce American methods of cultivation and American crops. The farm, wrote Brill later, focused on experimental work and illustrated “the teaching of agriculture and its allied branches to the students that later may come there.”

According to Stross, Brill arrived in Wuchang in the fall of 1897 full of high hopes which soon fell. The Chinese government was in turmoil, unrest was brewing, and Zhang seemed to question his decision to employ Brill. Brill’s problems began in the school’s first semester, when only ten students, mostly city boys with no knowledge of agriculture, matriculated. This first class of students also knew no English and lacked discipline. Brill wrote, “...to teach English and other elementary studies is not really our work.”

But Brill’s biggest frustrations were that Zhang had not yet procured any land on which to build the model farm and that no one in the government seemed to have the authority to assist the College’s leader. Brill wrote to Zhang for months, getting little response. On April 8, 1898 he wrote, “As yet nothing definite has been done in the way of securing land for a farm; and as my assistant will soon be out with seeds, trees, etcetera I am very anxious to have someplace to set them. At best it will be very late in the season.” Two years elapsed before Zhang secured some land, but the military appropriated it soon after. One of Brill’s last letters to Zhang expressed his frustration: “I wish to say that I have no fault to find with anyone in particular, but the system under which we are working is entirely wrong. . . .”

Stross explains that early in 1900, Zhang and Brill agreed that Brill would end his contract at the school six months early. He left Hupei province to travel in China as an agricultural explorer for the United States Department of Agriculture. Gerow Brill had put in a noble effort at the Hupei Agricultural College and Experimental Farm. The college lived on under the direction of Japanese agriculturalists for eleven years. Perhaps the time had not been right for a westerner to open a college in China, or perhaps the provincial government was too preoccupied with a China in turmoil to see that the Hupei Agricultural College should be strengthened. Whatever the reasons for Brill’s shortened stay in China, he accomplished a great deal by building a foundation for agricultural trade between the nations, and made Cornellians proud to call Brill one of their own.

by Catherine G. Healy ’92
SPROUTS: THEY ARE EVERYWHERE!
Today it seems in no matter what sandwich, salad or entree you order there are always sprouts nearby. These sprouts are just one sampling of the alfalfa industry in the United States. Your glass of milk is also a product of alfalfa, processed by cows into a healthy drink. Sprouts, milk and alfalfa are three different parts of the agricultural industry.

Cornell University, considered one of America's leading research institutions, is also a member of the agricultural industry. Ever since the first chemical formula was mixed in a Cornell laboratory, Cornell researchers have continually made strides in a wide spectrum of fields ranging from the improvement of machinery for cars to the development of improved tomatoes. It seems that whenever a breakthrough is made in the areas of science, health or agriculture there is inevitably a Cornell connection.

What is the connection between alfalfa sprouts, your glass of milk and the scientists of a leading research institution? A team of Cornell scientists has just developed six new alfalfa varieties. These varieties have the capacity to withstand attacks by up to five alfalfa-attacking fungi or bacteria.

The defensive capabilities of these new varieties is important because alfalfa is grown by farmers to produce hay, silage and pasture for their farms. Alfalfa hay is grown across the United States with about 88 million tons of alfalfa produced annually by growers. These 88 million tons translate into approximately seven billion dollars in market value.

The newest varieties were developed by a team of Cornell researchers headed by scientists Donald R. Viands and William Pardee, both members of the Department of Plant Breeding at Cornell. Four of the new varieties—Medallion, Pinnacle, Saber and Victory—were released to seed companies in 1989. These companies, in turn, produced...
seed for commercial sale in the spring of 1990. These varieties were sold to growers in the northeastern section of the U.S. Seeds of the other two varieties—Eclipse and Majestic—are currently being produced and will be available to growers in the spring of 1991.

Within the huge alfalfa market in the U.S., explained Pardee, "We need many different varieties of alfalfa." Each alfalfa variety has its own special properties, making some varieties more appropriate than others for certain areas of the country. The new varieties developed by Cornell researchers have been designed specifically for the climates and soils characteristic of the northeastern section of the U.S. Among the six varieties, for example, Victory and Eclipse are the most winter-hardy, making them the best suited for extremely cold climates.

These new varieties contain a bred-in resistance to the five most serious soil-borne diseases affecting alfalfa sprouts. Soil-borne diseases, because they actually live in the soil surrounding the plant, cannot be controlled by pesticides. Three diseases the new varieties are resistant to are verticillium, fusarium and bacterial wilts. These organisms attack and plug the alfalfa plant's internal "plumbing," preventing water and nutrients from reaching the upper parts of the alfalfa plant.

Because of their resistance, the new alfalfa varieties have a better chance of surviving than varieties susceptible to the soil-borne diseases. Scientists hope the new varieties will extend the productive life of alfalfa crops, bringing increased income to alfalfa growers and reducing the cost of producing milk.

Alfalfa research and development has been an important program at Cornell since 1946. Cornell scientists, according to Pardee, have been responsible for the development of numerous varieties of alfalfa as well as strains of clover, grasses and other forage legumes. The guiding objective of this research and development program since its onset, according to Pardee, has been to develop crop varieties that can resist insects and diseases, improve crop production and enhance the environment.

Two of the program's biggest challenges, during its 46-year life, have been to find ways to increase plant resistance to diseases attacking alfalfa crops and to attempt to reduce the amount of pesticides used to grow and maintain alfalfa crops. Pardee said the ability scientists now have, as shown by the new varieties, to develop varieties resistant to disease will help them overcome some of these problems. "We now must work on ways to increase insect resistance, so growers can reduce the amount of pesticides they need to kill crop-destroying bugs," said Pardee.

The newest varieties from Cornell's alfalfa research program were developed using breeding stock known for their top-notch forage production and for their ability to survive in a variety of climates. Pardee feels these new varieties will "improve the farmers' ability to remain competitive and produce a high quality product." The new varieties are, in fact, examples of a rapidly emerging group of new alfalfa varieties with multiple disease resistance. These new varieties are coming from alfalfa research and development projects underway all over the U.S.

Pardee said the Cornell research team is also working to improve the nutritional quality of alfalfa varieties. In upcoming months, the team plans to release additional varieties of alfalfa with built-in resistance to an even larger spectrum of diseases. Cornell researchers also have an active program aimed at producing varieties resistant to enemies of alfalfa like the alfalfa weevil.

Cornell's research and development of alfalfa will continue for a long time. Many of the alfalfa varieties developed at Cornell over the past 46 years have been used by breeders all over the U.S. as "breeding materials for developing other commercially useful varieties," said Pardee.

So, the next time you encounter a clump of sprouts in your sandwich or you drink a glass of milk, think twice about what you are digesting. Those products stem from one of a farmer's most valuable crops and one of a Cornell research team's most important projects.
PEST CONTROL HAS ALWAYS BEEN
of great concern for farmers, commercial growers and others who choose to grow their own gardens of fruits and vegetables. Scientists and commercial growers have known for many years that there are certain plant species, that when grown as cover crops, act as poor hosts for crop diseases. These plants can also efficiently suppress the growth of destructive weeds and repel insects.

However, although these cover crops have proven satisfactory for many orchards and vineyards, their use in small fruit crops such as strawberries has not been extensively explored.

About two years ago, Professor Marvin Pritts, from the Department of Fruit and Vegetable Science, began researching and experimenting with various preplant cover crops for strawberries. The ideal cover crop would have to prove efficient in reducing weed levels, reducing nematode levels and improving soil nutrient status and organic matter content. It would also have to act as a non-host for insects and diseases. Finally, this plant would have to be easy and inexpensive to establish.

The next phase was choosing several cover crops to test. "The [cover] crop would grow between the strawberries and out-compete the weeds or displace any weeds that might try to grow, yet not compete with the strawberry plant," said Pritts. "The interseeded crop would then die during winter, leaving nothing but strawberry plants in [the] spring. This is essentially what a strawberry grower would want." So samples of marigold, fescue and sudangrass were seeded between rows after berry harvest.

Unfortunately, not all the samples proved successful. The marigolds competed with the strawberries for water and thus weakened the growth of the crop. The fescue grass also competed with the strawberries for the various nutrients in the soil. "The sudangrass seemed to be the most ideal," said Pritts. Although it did not necessarily satisfy all the ideal requirements, the sudangrass successfully suppressed nematodes and weeds. The grass posed one problem, however—it grew too tall. Thus, the result was an overshadowing of the strawberries which would have eventually led to a slow decline of the strawberry planting.

Currently, Pritts is working on a few solutions for the problem of height control in the sudangrass. He suggested that grass planted later in the season may not grow as tall. One could also mow the grass to about twelve inches on a regular basis, but this would be time consuming. A faster and easier way was found with the use of a selective grass herbicide called sethoxydim (Poast). In order not to kill the grass, approximately one-twentieth of a normal dosage must be used and it is applied when the grass is about the same height as the strawberries. This method has presently proven successful in controlling the height of the sudangrass.

Interest in this system of weed control in strawberries has grown immensely. The use of sudangrass offers growers an alternative to heavy herbicide and chemical use. The ultimate goal of such research will eventually lead to reduction or elimination of some pests while also reducing interference with strawberry crops. If the system is successful, growers might be able to eliminate all pre-emergent herbicides and fumigants from strawberry cropping systems.

There are still some concerns, however. Pritts is still in the process of finding out what effects the adoption of this system will have on insects and diseases. The results could be either positive or negative. One effect may be an increase in the insects and crop diseases. But it is also possible, explained Pritts, that the strawberries may be harder for the insects to find. But, all in all, the final objective is "to anticipate the future needs of growers," said Pritts.

by Wendy E. Austrie '91
LITTLE MISS MUFFET IS PROBABLY still the only person to use whey as a dietary staple. Since the 1970s, though, scientists have been studying ways to use this byproduct of cheese production. Researchers in the Department of Food Science and in the Northeast Dairy Foods Research Center at Cornell University are currently developing uses for whey in the food industry.

Whey is the liquid solution of lactose, protein and minerals that remains after making cheese. About 85 to 90 percent of the original quantity of milk is whey; for instance, 100 pounds of milk yields ten pounds of Cheddar cheese and 90 pounds of whey.

Historically, whey has been considered a waste product; the cheese industry often disposed of it by dumping it into streams. By the 1950s, there were fewer but larger cheese plants, and the dumping practice was lethal: the algae population in the streams exploded, and fish died from the pollution.

Twenty years ago, environmental protection laws against this method of whey disposal prompted serious study of practical uses of whey, according to Jonathan Hopkinson, a graduate student in the Department of Food Science. Whey had sometimes been used as animal feed, but now the goal was to process it to a quality suitable for use in human food.

Cheese-making produces two kinds of whey, sweet and acid. Making Cheddar cheese yields sweet whey; cream cheese yields acid whey. The proportions of the components of whey vary as well; the solids in sweet whey from Cheddar cheese manufacture are typically 80 percent lactose.

Hopkinson, a former product technologist for the dairy producer Dairylea, explained the use of sweet whey in the manufacture of ice cream.

"Whey protein aerates the ice cream. That adds to its stability. Whey is used to boost the solids content of the ice cream, and it's less expensive than milk solids," he said. He noted the drawbacks of using whey: "It adds a whey flavor—slightly cheesy, slightly oxidized, a little rancid. It adds considerable lactose and not much protein. It feels sandy and leaves a gritty feeling in the mouth that won't go away." Hopkinson pointed out that the Cornell dairy plant does not use whey in its ice cream.

Currently, whey research at Cornell primarily involves using sweet whey in baking. Whey varies in its composition and its functional properties, said graduate student Lance Phillips. "When we talk about utilizing whey, we have to understand it on the chemical level," said Phillips. Understanding the chemical composition of whey is one of the biggest challenges in the three-year project Phillips is co-investigating through the dairy center. The project examines the foaming property of whey and its application in whipped products.

To obtain the whey proteins beta-lactoglobulin and alpha-lactalbumin, the lactose, salts and fat must be removed from the whey, said Phillips. The protein solution is freeze-dried to 5 percent moisture at neutral pH, then filtered. The resulting solids can then be whipped "right up out of the bowl," as Phillips put it.

How can the foaming function of whey be applied in baking? Bread is a solidified foam, Phillips explained; it contains air. Egg white is often the main ingredient for holding the air in breads or cakes, but whey protein is less expensive than egg. Industries that use whey protein instead of egg can operate at lower cost and give more business to the dairy industry.

A problem Phillips has seen is that companies do not share information for fear of competition. When scientists research and report improved processes, "We end up reinventing the wheel a lot of times," Phillips noted.

In New Zealand, they make dry nonfat milk products, and the U.S. imports most of it for products like Coffee Mate and Dream Whip. Technological advances made here are not usually applied to industry," he said. "Industries need to hire technical people to translate [technology] into something they can use."

Phillips added that the existence and work of the dairy center can help the food industry as a whole. "If a company doesn't have the money to maintain a research and development group, we are a good source that's often overlooked," he said. "Companies that don't utilize whey don't make money," he said. "They may break even, but they won't make a profit because of the waste-treatment costs."

It seems that technology has finally caught up with and improved upon an old nursery rhyme. Little Miss Muffet would be pleased that dairy research is making whey an important ingredient in many foods, and she would be impressed with the benefits of whey utilization to the environment.
BEASTLY BEE FILMS THAT YOU CAN pick up at your local video store include The Swarm, Terror Out of the Sky, The Savage Bees and The Killer Bees. In reality, as on film, the stars of these horror movies—the Africanized honeybees—are swarming toward a city near you. Though the press, the United States Department of Agriculture (USDA) and American beekeepers and entomologists are concerned, these bees aren’t as scary as Hollywood makes them look, according to Professor Roger Morse ’50, MS ’53, PhD ’54.

Morse, professor of apiculture in the College of Agriculture and Life Sciences’ Department of Entomology, has studied Africanized bees for 19 years. He believes that with proper management and breeding, the Africanized bee will not threaten beekeeping, agriculture or the public health in the United States.

Morse’s is a minority viewpoint. “I’m saying we are going to work our way around this situation and there are some that say we can’t do that,” he explained.

All this controversy centers around the tiny, but feisty, Africanized bee, a hybrid of the African honeybee (Apis mellifera scutellata) and the European honeybee (Apis mellifera). According to “The Africanized Honeybee,” an article by Morse and Scott Camazine in the September-October 1988 issue of American Scientist, the hybrid has been moving northward at a rate of 200 to 300 miles per year since its accidental escape from captivity in Brazil in the late 1950s.

The more aggressive Africanized bees have displaced European bee races that were previously the sole honeybees in North and South America and have at least temporarily disrupt-
A small swarm of Africanized bees surrounds the caged queen bee in this student's hand. "If things were as bad as people thought, one wouldn't be doing things like that," Morse said.

Concerned groups have three principal fears according to Morse. First, they believe that the bee's aggressiveness will be a public health hazard. Second, they fear the tendency of Africanized bees to swarm and to abscond more easily than European bees. Third, they think the Africanized bee will not be as good a honey producer as the European bees it will displace.

Morse readily admitted that Africanized bees are more aggressive than European bees. Though an individual sting from an Africanized bee is no worse than that of a European bee, Africanized bees can react three times faster to an intruder, can inflict ten times as many stings and will pursue aggressors over longer distances, Camazine and Morse explained in their American Scientist article. "They are good defenders of their homes," Morse said. "That is usually a trait we admire in animals."

Morse denies that this aggressiveness is unmanageable. "The truth is that they can't be managed using exactly the same techniques we use in North America," he said. Stinging incidents can be reduced, Morse explained, by using larger smokers (devices that interrupt bees' senses) and wearing better protective clothing than beekeepers in the U.S. now do, by breeding for gentleness, by developing public education programs and by placing apiaries farther away from people. The absence of scare stories about Africanized bees in Brazil and in their native Africa is evidence that these techniques work.

Like Morse, Marcia Pirmez, who was a commercial beekeeper in Brazil for eight years before moving to New York, does not see the bee's aggressiveness as problematic. "Once you put the clothes on, you can work [with Africanized bees] as well as you can work with [bees] here," she said.

Proper management techniques also reduce swarming and absconding, Morse said. When a colony swarms, the queen bee and half the colony leave the nest. Swarming is a response to overcrowding of a hive. When bees abscond, the entire colony seeks a new nest site. Absconding is a response to adverse conditions such as an insufficient food supply.

Swarming and absconding weaken commercial bee colonies and increase feral populations which compete with commercial bees for nectar and pollen. Both can be reduced by harvesting honey once a month, by feeding sugar syrup to bees during poor nectar flows and by dividing large colonies, Camazine and Morse wrote in their 1988 article.

In response to fears that Africanized bees will be poorer honey producers, Morse noted Brazilian beekeepers' success with Africanized bees. When Africanized bees were introduced into Brazil, they rapidly displaced European honeybees, and the country's beekeeping industry declined. Over the next several years, Brazilian beekeepers learned to use breeding and the management techniques that Morse advocates to work successfully with the hybrid.

Today the beekeeping industry in Brazil is flourishing. Honey production takes place in areas where it did not before and is ten times greater than it was prior to the introduction of the Africanized bee.

Both pessimists and optimists agree that the Africanized bee's resistance to Varroa jacobsoni, a parasitic Asian mite, is an advantage over European bees. While Robert Stevens, president of the Empire State Honey Producers' Association, estimated that 1,000,000 colonies were lost to Varroa and tracheal mites in the U.S. in 1989, beekeepers in Brazil don't even treat for Varroa. "We find [Varroa] in every colony where we look for them in Brazil, yet no one is concerned about them," Morse said.

"The USDA has stated a policy—we will not learn to live with the African honeybee," wrote author Kim Flottum in an article in the October, 1989, issue of Gleanings in Bee Culture. Morse advocates the opposite approach—as we cannot stop the bee's migration, we must learn to live with the Africanized bee. Morse is convinced that, though it may take a few years, the beekeeping industry will adapt to the hybrid and the general public will never notice the changes in the bee population.
IN MANY WAYS, THE EXCELLENCE of an institution is best reflected by the success of its alumni, and judging by the accomplishments of the alumni honored at the College of Agriculture and Life Sciences Alumni Awards Banquet on November 16, 1990 the New York State College of Agriculture and Life Sciences at Cornell is certainly a major player.

Celebrated for their leadership and involvement on behalf of the College, recognized success in their businesses, professions or other vocational endeavors and significant contributions to the betterment of society through humanitarian endeavors, the recipients of the 1990 Outstanding Alumni Awards were Donald M. Bay '55, T. Norman Hurd PhD '36, Philip D. Gellert '58, MS '60, Herbert R. Kling '36, MS '40 and Charles P. Bailey '84 who received the Young Alumni Achievement Award.

Among the notable alumni is Hurd, who has had a distinguished career in education and public service and is one of the most admired and respected figures to arise from the New York state government. Hurd began his career as an assistant professor of agricultural economics at Cornell in 1936, but left the University in 1943 to serve as Director of the State Farm Manpower Service. He returned to Cornell and taught until 1950, when he was appointed as Director of the Budget under Governor Dewey. He once again returned to Cornell and taught from 1954 to 1958, when he was persuaded to join Nelson Rockefeller’s administration.

David Call '54, Dean of the College, tells a humorous story of how he was the teaching assistant under Hurd for an introductory course in business economics in 1958. When Hurd was invited to Albany by Rockefeller, he left Call to teach the class by himself with one day’s notice. As Call puts it, “I taught the class right out of the textbook, and not very well, I’m afraid.”

Hurd spent eleven more years as director of the budget, and then moved on to spend two years as director of state operations and two years as secretary to the governor. He left state service in 1974, spending two years in Washington, D.C., as a part-time assistant to President Gerald Ford.

Hurd’s career has brought him many honors including the Rockefeller Award for Excellence in Public Administration in 1981, and an honorary doctor of law degree by the trustees of SUNY. In addition, in 1987 he was the first recipient of the S. Kenneth Howard Career Achievement Award of the American Society for Public Administration.

Since graduating from Cornell, Philip D. Gellert ’58, MS ’60, has been a successful businessman, a committed alumnus and a champion of education. Gellert joined his family’s business, Pine Lane Poultry Farm, upon graduation and assumed presidency in 1967. Under his leadership the company’s annual sales soared to nearly $10 million. He retired from active management of the company in 1986, turning the presidency over to his son, and is now owner and president of the Northern Empire Land and Livestock Company, a development firm with one of the largest land holdings in eastern upstate New York.

Gellert has also worked hard to encourage rural youth around his Hudson Valley home to pursue educational opportunities at Cornell. He is known as “the man from Cornell” and, at his own expense, has personally transported many students to college open houses and arranged interviews with the admissions office.

He is also a valuable member of the ALS Alumni Association. In 1986, he set up the dean/alumni get-togethers that are now held throughout the state. Since then he chaired the ALS Alumni Auditorium Task Force, which raised more than $700,000 to furnish and equip the auditorium, and is a member of the ALS Development Committee.

Call remembers sharing an office with Gellert while they were both working on their master’s degrees. According to Call, even as a student, Gellert had hundreds of enterprises and businesses going at once. Call often found himself acting as Gellert’s personal secretary, and threatened that if Gellert did not give him a cut of the profits, he would stop answering the phone! It is clear that at some point Dean Call was the one who was telephoning Gellert.

These alumni of the College of Agriculture and Life Sciences, together with the past recipients of Outstanding Alumni Awards, have achieved life success, and their recognition gives us an opportunity to reflect on the impact our alumni make on important issues facing us today, and those that we will face tomorrow.

by Hilary Nagler ’91
Hansel Named the Distinguished Professor of Animal Biotechnology

William Hansel, the Liberty Hyde Bailey Professor Emeritus of Animal Physiology and a member of the Cornell faculty since 1949, has been named the Distinguished Professor of Animal Biotechnology at Louisiana State University. Hansel, who is 71, will leave for Baton Rouge in October to continue his research in animal development. He will also teach an undergraduate course under an endowed professorship supported by the agriculture and veterinary colleges and the Department of Veterinary Science at LSU.

Cornell Student Wins Trees Scholarship

Patricia Lindsey, a Cornell student, has won a $25,000 scholarship from the New York Board of Trade in a statewide competition. Lindsey’s research explores how much soil is needed by large trees in urban settings. She also hopes to recommend a soil mix that will give trees more space for root growth but still withstand heavy pedestrian use. Lindsey is a doctoral student from Raleigh, NC, studying under Cornell professor of urban horticulture, Nina Bassuk.

Book-of-the-Month Club Alternate

Jeanne Mackin, staff writer for the Cornell Cooperative Extension Consumer News Service, has had her first novel selected as an alternate by the Book-of-the-Month Club. Her novel, The Frenchwoman, has been termed “imaginative, fast-paced and impassioned” by Kirkus Reviews.

The book is about a young Parisian woman who becomes a seamstress for Queen Marie Antoinette. “Good historical fiction isn’t fairy tales, it’s a way of exploring the world and how people fit into it,” Mackin said. “I firmly believe that if you don’t remember the past you repeat it, and historical fiction is very useful for bringing this across.”

In her Comstock Hall office, she writes about the latest research in child development, consumer economics, financial management, gardening, gerontology, nutrition, home design and safety for the Consumer News Service.

Mackin grew up in Geneva, NY and graduated from Ithaca College in 1970. She now shares a 20-acre farm with her husband, Cornell art professor Steve Poleskie.

Pearson Promoted to Professor of Plant Pathology

Roger Pearson, has been promoted to professor of plant pathology at Cornell’s New York State Agricultural Experiment Station in Geneva, NY. Pearson has the statewide responsibility for research and extension on fungal diseases of grapes in New York.

A native Californian, Pearson received his Ph.D. from the University of California, Davis. He came to Cornell in 1973 as a research associate of the department of plant pathology and was promoted to associate professor in 1981.

Pearson has won recognition for his research on powdery mildew, the most important grape disease in the world. A paper published in 1987 by Pearson and his colleagues showed that the spores that infect grapevines every spring in New York originate from small overwintering structures that survive the winter in cracks on vine bark.

He has spent sabbaticals at major grape-growing area research stations in France, Germany and Switzerland. Pearson’s reputation has led him to be asked to edit the Compendium of Grape Diseases for the American Phytopathological Society, a book that describes all the known grape diseases in the world.

Seem Appointed Associate Director

Robert C. Seem, an associate professor of plant pathology, has been appointed Associate Director of Cornell University’s New York State Agricultural Experiment Station in Geneva. He will spend half of his time as associate director and the other half continuing his research assignment on plant pathology problems.

He works on quantitative epidemiology of diseases of fruits and vegetables. This includes studying such diseases as apple scab, cedar apple rust, grape downy mildew, and common maize rust. He is currently working with Dr. Alan Lakso, Horticultural Sciences, on an apple tree simulation project.

Search for Excellence Award Presented to Rakow and Weir

Donald A. Rakow and Richard Weir III have been presented the Search for Excellence Award in the category of Urban Development Programs for their Cornell Cooperative Extension Publication “An Illustrated Guide to Pruning Ornamental Trees and Shrubs.”

Donald Rakow is an assistant professor of landscape horticulture in Cornell’s Department of Floriculture and Ornamental Horticulture. Richard Weir is horticulture program leader for Cornell Cooperative extension, Nassau County, New York.

Magazine Wins Consumer Education Materials Contest

“Alive! Food and Fitness for Life,” a one-issue magazine published by the Division of Nutritional Sciences to promote attitudes and behaviors for good nutrition and health among teenagers, is a 1990 winner in the Food and Drug Administration’s Third Annual National Consumer Education Materials Contest.
Research with Heart

HEART DISEASE IS THE LEADING CAUSE of death in the United States, according to the American Heart Association. Fortunately for the American public, deaths due to heart disease have decreased by 40 percent over the last 25 years, reports Thomas J. Moore in his book Heart Failure. One possible cause of this decline can be attributed to our increased knowledge of what causes heart disease and how it can be prevented.

Dr. Donald B. Zilversmit, professor emeritus of nutritional biochemistry at Cornell University, has been at the forefront of this research for over 40 years. "He was one of the leading individuals who demonstrated that serum cholesterol ended up being deposited in our arteries," said Zubertio Garza, director of the Division of Nutritional Sciences. A buildup of cholesterol in the arteries, called atherosclerosis, can lead to heart disease and eventually heart attacks. "No one was sure of this before his pioneering work," Garza added.

On November 1, 1990, Dr. Zilversmit's contribution was recognized by the Bristol-Myers Squibb Mead Johnson Award for Distinguished Achievement in Nutrition Research, valued at $50,000. "I think it is well deserved," said Dr. Andre Bensadoun, professor of nutritional biochemistry at the College of Agriculture and Life Sciences. "If anything, it is long overdue."

"I was very pleased," said Garza, a member of the selection committee. "It is one of the premiere prizes. He joins a very illustrious group of researchers. Besides being an outstanding scientist, he has a very high regard for ethical standards. He combines scientific rigor and a high regard for ethics in all of his work," Garza added.

The Bristol-Myers Squibb award is just one more indication of the influence Zilversmit has had on the field of nutritional research and heart disease. In 1959, the American Heart Association appointed him to the lifetime post of career investigator.

"For most of my career, I have had generous support from the American Heart Association," said Zilversmit. The National Institutes of Health have also awarded grants to Zilversmit. "Without these two sources of support, it would have been very difficult to carry out this research," he noted.

In addition to his research regarding heart disease, Zilversmit developed a mathematical equation used in tracing radioactively labeled substances. "The equation, describes in mathematical terms the rates at which various isotopically labeled compounds in the body are converted or transferred," he said. "It describes the dynamics of metabolism in a quantitative sense."

Regarding the equation, the chair of the selection committee, G. Harvey Anderson said, "This development had profound consequences for medical science well beyond heart disease."

However, Zilversmit's main area of research has been heart disease. "His work is very central to the general field of cardiovascular disease," said Bensadoun. "He has played a very useful role in summarizing the information and coming forth with the hypotheses. His work has been very useful to those working with humans. He did with animals what couldn't be done on humans."

For years, the American public and even some scientists seemed reluctant to believe the connection between cholesterol levels and heart disease. There were also "commercial interests" of lobbyists, said Zilversmit. "They wanted proof before we (the scientists) advised the public. Personally, I have doubts about everything, but I really have no substantial doubt about the connection between cholesterol and heart disease," said Zilversmit.

Zilversmit said that scientists were aware of a high degree of correlation between the two factors, but a correlation does not always prove to be a cause-and-effect relationship.

Recently, the American public has become very concerned with cholesterol. "I am puzzled by why, in the last year or so, the climate has changed," said Zilversmit. "There are no quick fixes; it takes a prolonged commitment to making these lifestyle changes," he said. "Like exercising," he said, "you can't do it once very strenuously and then not expect to exercise again."

Zilversmit's award-winning work on heart disease is a milestone in medicine. Already, however, the scientist has moved on to new research. "I'm developing a new project which is more theoretical," said Zilversmit, who recently retired from the colleges of Agriculture and Life Sciences and Human Ecology. "It has to do with the various ways in which people present research findings." If his past accomplishments are any indication, the world of science can soon expect exciting things from Donald Zilversmit in his new arena.

by Karen E. Clements '92

New York State College of Agriculture and Life Sciences, a Statutory College of the State University, at Cornell University
The Other War in the Gulf
See page 12
About the Issue

Though the War in the Gulf is drawing to a close, it doesn’t mean that we are out of danger yet. Hundreds of oil wells are burning in Kuwait, and because of land mines, firefighters are unable to reach them. Even more than that, millions of gallons of crude oil are contaminating the Persian Gulf, and in the process, severely damaging the environment. There is still a battle to be fought, a war to be won. For more, see page 12.

What’s in a name? The Countryman staff has been struggling with that question. Is our name sexist or generic, a time-honored tradition or a stubborn throwback? The point here is that we want your opinion! Should the name of this magazine change? The editorial staff urges our readers to send us their comments and suggestions.

On the Cover:
Graphic by Benjy Kile

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WHEN ONE LOOKS AT STATISTICS concerning the trash situation Americans face today, it is almost alarming to realize how little we do to help ourselves. The Department of Residence Life Recycling Committee came up with a list of "Amazing Facts" about recycling. Here are some excerpts:

- Americans throw away ten times their weight in trash every year.
- In 1989, Americans threw away enough office paper (4 million tons) to build a 12-foot-high wall that would stretch from New York to Los Angeles.
- The amount of garbage we produce in New York state in one year would cover an entire football field to a depth of almost five miles.

Gerald Furnkranz, Residence Life Facilities Manager of Training and Quality Assurance, reported that Cornell University residents generate 180 tons of trash per month. Of that, almost half is potentially recyclable.

January 1990 not only brought forth a new semester at Cornell, it brought with it a program that will change how many students look at their lifestyles. A large-scale recycling program has been introduced at the residence hall level, where students will have the opportunity to see what differences they can make.

Furnkranz oversees this large scale operation. "The program has been instituted into all of the undergraduate facilities, and into several of the graduate halls," Furnkranz said. "Plans are in the works to reach the rest of the graduate units."

Each facility received six bins apiece for their recyclable trash. Each bin has been designated for a different material such as: dry newspaper and newsprint; computer paper, stationery and notebook paper; laundry/bleach containers and shampoo bottles; green, brown and clear glass; metal and food cans; and corrugated cardboard.

Each container within the residence hall is labelled with directions as to what materials can and cannot go into the bins. Placing the wrong materials into the bins leads to contamination and will cause the trash to end up in a landfill and not at the recycling facilities.

Initially, the program directors hope to see residents recycling about ten percent of their total trash. It is anticipated that the program will work at maximum efficiency after four years. This will allow the program to reach all of the new classes as they arrive.

Contamination remains one of Furnkranz's primary concerns. "It is very important that students know what is to go into each bin," he said. "Proper participation by the students and the residence hall staff is needed for the success of this program."

If a person is not familiar with what can be recycled, it might be in the best interest of the program if that person did not use the bins. It is better not to recycle than to contaminate a container. It only takes one person to completely negate the efforts of others.

Students will be able to monitor their progress during the semester with the aid of a recycling thermometer that will be placed in the Cornell Daily Sun. Furnkranz noted that the total tonnage of mixed paper, plastic, glass, metal and corrugated cardboard will be recorded. Paper makes up about 41 percent of trash that is produced.

At this time, Furnkranz hopes to reach around 40 percent of residents. Education within the halls plays an important role in accomplishing this. Through hall programming, knowledge about the proper use of the bins can be provided.

"We have seen considerably more success in the halls where programming has reached a majority of the students," he noted. "Knowledge is the key to solving the problems of contamination."

Ramona McGee, a resident of Schuyler House, welcomes recycling. "I think that the program will be very beneficial to the students of Cornell," she said. "This program will give the students a chance to become more aware of the environment, and what they can do to help."

As the recycling program becomes more popular and successful, Residence Life looks to expand the program further. They would like to see the program include a new bin to handle magazines and be extended to the family housing units.

by Shawn Vargo '91
BOUND BY

by Jeff Grant '91

"MUCH READING AND RESEARCH on witchcraft can be done satisfactorily in any of the great libraries of the western world, but ultimately scholars must make their pilgrimage to the center of learning high above Cayuga's waters." So reads a line from noted field expert Rossell Hope Robbins' introduction to the Catalogue of the Cornell Witchcraft Collection.

The Cornell collection, which includes books on topics such as theological and legal disputations, witchcraft trials and demonic possession, is housed in the Department of Rare Books at Olin Library. This extensive collection consists of roughly 2,700 volumes, most of which were written in England, France and Germany during the fifteenth through the seventeenth centuries. Although less than ten percent of the books are in English, there are still over 200 volumes accessible to those without command of a foreign language.

Even so, James Tyler, assistant rare books librarian at Olin, warned that the focus of the collection could be a bit different from what one might at first expect. "When people hear 'witchcraft collection,' they think of turning their boss into a frog, changing lead into gold or casting spells. But it's not that type of thing," insisted Tyler. "It pretty much stays away from subjects like the occult; rather it tries to make some sense of what people do to each other and why."

According to Tyler, the main purpose of the collection is to examine the persecution of supposed witches by the church. "People don't realize that this persecution was analogous to something like the Holocaust during World War II," he added. "Two hundred years is a long time for something to go on that people later decided was a mistake."

It was this darker side of human nature that so intrigued Cornell's first president, Andrew Dickson White, that he set about assembling the collection in the late 1800s. Commented Tyler, "White was fascinated with the problem of reason versus superstition. As a historian, he viewed witchcraft as, basically, a delusion of society."

In his published autobiography, White mentioned that during the winter of 1877 to 1878, he devoted much of his time in Stuttgart to the study of the history of criminal law, and especially the development of torture in procedure and punishment. "I realized as never before," wrote White, "how much dogmatic theology and eclesiasticism have done to develop and maintain the most frightful features in penal law."

White noted that, as justification for their actions, people argued that "...since the Almighty punishes his erring children by tortures infinite in cruelty and eternal in duration, earthly authorities may justly imitate this divine example so far as their finite powers enable them to do so."

And in A History of the Warfare of Science with Theology in Christendom, published in 1896, White further chastised the church for its role in fettering the pursuit of truth through science. Lest it seem that he was being unduly harsh in his assessments of the issues at hand, and perhaps in response to the unofficial labeling of Cornell as a "godless" university because of its lack of religious affiliations, White wrote that he sought "...to strengthen religious teachers by enabling them to see some of the evils in the past which, for the sake of religion itself, they ought to guard against in the future."

Although White provided the impetus for starting the witchcraft collection, he was not alone in the task of acquiring books for the new collection. George Lincoln Burr, a librarian and White's personal assistant, was instrumental in the project. Said Tyler, "[The two] crisscrossed Europe looking for interesting pieces to add to the collection. There were a lot of items to be found and back then the books weren't too expensive." In fact, most of the current collection was assembled by White and Burr.

Like White, Burr had both personal and scholarly interest in the collection. In an article that appeared in the December 1902 issue of The Bibliogra-
A. D. White, founder of Cornell's witchcraft collection.

phor entitled "A Witch-Hunter in the Book Shops," Burr wrote of the hard work involved in tracking down items for the collection: "Aye . . . the long vacation tours by rail or foot through all those book-rich lands, now threading

The Fortalitium Fidei is just one of many rare volumes in the collection. The collection also includes 14 editions of the Malleus Maleficarum, or Hammer of the Witches, sort of a "handbook for exterminating witches," said Tyler, which was obtained by White himself in 1878. This work, first printed in 1486, was tabbed by White as the book that "... had caused more suffering than any other product of human pen."

According to Tyler, who has been with the Department of Rare Books for over 18 years and is responsible for purchasing items for the witchcraft collection, the collection is considered by many experts to be the best of its kind in the world. "There's a lot of material in archives in Europe and in Salem, Massachusetts, but Cornell's collection has purposely been developed to provide exhaustive coverage of a limited subject area. It's virtually unique."

Because of the richness of the collection, it is regarded as a valuable resource by a number of members of the Cornell community, as well as by visiting scholars. Heather Findlay, a graduate student working on a PhD in English, is writing her dissertation on witchcraft in English drama and makes extensive use of the collection. Findlay, who taught a freshman writing seminar entitled "Writing About Witches" during the spring 1990 term, became interested in witchcraft as a result of studying English Renaissance attitudes towards women. She feels that the major strength of the collection is its "very thorough holdings in sixteenth and seventeenth century English witchcraft treatises."

David W. Sabean, a professor in the Department of History in the College of Arts and Sciences, agrees that the collection is "probably the best in the world." While teaching his class "Cultural and Social History of Absolutism" during the fall 1990 semester, Sabean introduced his students to the collection by suggesting that each of them question some of the witchcraft cases documented therein. The students delved into topics including the inter-relationship of religion and witchcraft and various gender issues.

Sabean sees the collection as an important study in "unreason" and feels that the texts are "valuable tools in enquiring about a number of larger issues." He added that he plans to make use of the collection in the future, as well.

Truly, there is little doubt that as long as people share A.D. White's interest in this tragic breakdown in human thinking, they will continue to make the pilgrimage to Ithaca to study the witchcraft collection.
A Voice in the Wilderness

Anne LaBastille's companions in the woods greet her.

THE PEOPLE OF GUATEMALA CALL her "Mama Poc" for the rare native bird she fought to save from extinction. To thousands of readers she was the "Woodswoman" of the Adirondack Mountains, who lives an almost mythical existence alone in the log cabin she built herself. But to fellow warriors in the battle to save the world's wildlife, she is Anne LaBastille '55 PhD '69, author, conservationist and ecologist.

LaBastille's books about her solitary and independent life in the mountains have won her a large following of fans who yearn to live as she does—close to nature and without electricity and other modern amenities. Woodswoman and its sequel Beyond Black Bear Lake have inspired readers to treasure and preserve this country's wilderness areas, particularly New York's 6-million-acre Adirondack Park. But as a conservationist, LaBastille is unable to retreat full-time to her beloved home near Black Bear Lake. Worries about loss of wildlife and habitat in this country and around the globe keep her frequently involved in organizations such as the Adirondack Park Agency, The International Union for Conservation of Nature and the World Wildlife Fund.

LaBastille's latest book, Mama Poc: An Ecologist's Account of the Extinction of a Species, tells of her 24-year struggle to save the giant grebe—"poc" in Mayan—that lived only on a single lake in Guatemala.

In the fall of 1990, LaBastille returned to Cornell to speak about her experiences at Guatemala's Lake Atitlan. "My story is a tragedy," she said of the long war she waged against the forces of habitat degradation, natural disasters and political unrest which eventually destroyed the conservation plan and grebe sanctuary she built.

LaBastille's experiences in Guatemala and other Third World countries have stripped her of her "First World" naivete. LaBastille sees overpopulation and the poverty that accompanies it as the most critical problems facing world wildlife and wildland today. "What does a mother care if she kills an animal for food or torches off a piece of forest to plant corn as long as she can keep her little babies alive?" she asked. "The day that I came face to face with this issue and it really hit me was when I was in Guatemala doing an article for National Geographic," the ecologist said. "We drove to where we'd been assured we would find a beautiful last remnant of virgin cloud forest with resident quetzals (the national bird of Guatemala). But the whole side of the mountain was in flames." Confronting two native men who were burning and chopping down trees to prepare a cornfield, LaBastille demanded to know why they were destroying the precious wildlife habitat. "We have to eat," the men said soberly. That did more to get the idea in my head about what we're up against as conservationists than anything I've ever read," LaBastille said.

At home, in the relative affluence of the United States, there are more problems to combat. The toughest one, in LaBastille's opinion, is acid rain. "It kills things," she said, "Fish, amphibians, spruce trees. It's killing more things than we're aware of, right up the food chain. Top predators are being affected: loons, otters and other animals that eat fish. Maybe it's affecting humans, too." LaBastille, who served as a commissioner for 16 years for the Adirondack Park Agency, declared the Adirondacks "the worst hit place in the country." She said that action is needed immediately to stop the damage and that she thinks that the recently-passed Clean Air Act Amendment is a step in the right direction.

Another threat to the mountains that LaBastille loves so much is massive real estate development. She views the November 1990 defeat of New York state's Environmental Bond Act as a devastating blow to conservation in the Adirondacks. "Unless we can buy the wildland and put it aside now for the people of New York state, I don't think there'll be much left in another ten years. 'God ain't making land like that anymore,'" she said, quoting Will Rogers.

In between environmental battles and writing (she is the author of five books and over 130 journal and magazine articles), the award-winning conservationist/author finds respite in her isolated cabin. No road leads to her door; the only access is by boat and by hiking trails. Her only companions, most of the time, are her two German shepherds (her "best friends") and a chain saw, she said. It is there in the woods, among the trees and the wildlife she loves, that LaBastille finds the strength to carry on the battle.

by Elaine Bloom '91
Saving Trees to Save Lives

by Deborah Steuer '91

Each year 12,000 women die of ovarian cancer, but this year many women may live longer thanks to a new drug called taxol. Taxol, heralded as an “all-natural” drug, is extracted from the bark of the Pacific yew tree. However, nature’s medicine is hard to come by; two to three yew trees are needed to treat one cancer patient alone.

Rustin B. Howard MBA ’89, president of Phyton Catalytic in Ithaca, and his fellow researchers have found a way to replenish the limited resource of taxol. They have developed a way to coax the yew tree’s cells into producing taxol in the laboratory. Cells are grown in stainless steel vats containing a nourishing liquid medium, which is composed mainly of sugar and hormones. The cells are constantly reproducing, so theoretically cell cultures derived from only one yew tree could produce an infinite amount of taxol. “We’re trying to save people and to save trees. It will also put the United States at the front of a newly emerging technology,” Howard said.

The knack of this new technology is getting the yew tree cells to produce taxol. The cells produce taxol in response to an attacking enemy, often a fungus. When threatened, the cells produce compounds, called secondary metabolites, which counterattack and destroy the attacking fungus. The researchers at Phyton Catalytic add fungal cell extracts into the culture medium to trick cells into arming themselves against an attack.

Once the taxol is produced in the steel vats, it faces the challenge of a new enemy—the cancer tumor. Delivered intravenously to the tumor site, taxol enters a tumor cell and binds to protein structures called microtubules, thereby preventing the cell from dividing.

Since taxol is still in the experimental stages, it is only being tested on cancer patients who have had unsuccessful treatments of standard chemotherapy. Over the past several years of clinical trials, taxol has been shown to shrink the tumors in 30 percent of these patients with ovarian cancer, according to Professor David S. Ettinger, associate professor of oncology and medicine, who is researching the effectiveness of taxol in the treatment of cancer patients at The Johns Hopkins Oncology Center in Baltimore.

Taxol is administered to patients every three weeks through chemotherapy treatments. Like conventional chemotherapy, taxol has the same side effects. Ettinger said common side effects include nausea, vomiting, hair loss and lowering the white blood cell counts, which are needed to fight infections. But the battle seems to promise a greater chance of victory over cancer. “This is one of the most effective agents in the treatment of ovarian cancer. It’s showing promise not only in treating ovarian cancer but in other cancers as well,” Ettinger said.

Although optimistic about taxol taken straight from a tree, Ettinger said he is a bit skeptical about taxol cultured in a laboratory. “Taxol is a very difficult drug to make. The question is will [the cultured taxol] be the same drug exactly,” Ettinger said.

To answer this question, the Food and Drug Administration (FDA) is testing the cultured taxol in clinical trials. Howard said he expects the FDA to approve the new method within two to four years. If approved, the process will be able to provide an endless supply of taxol to the marketplace. Until then, researchers will continue to cut down yew trees in order to treat cancer patients.

But this may present a few problems. The 30-foot-tall Pacific yew trees, found in the Pacific northwest, take 200 to 300 years to mature. Petitions have been sent to the federal government to protect the tree as an endangered species. “It’s a very slow growing tree and probably doesn’t reproduce very readily. If it was cut down at extremely high rates, it would be lost as a minor component in the forest fairly quickly,” said Timothy J. Fahey, professor in the Department of Natural Resources.

For now, a choice must be made between the life of a woman and the life of a tree. In the future, the scientists at Phyton Catalytic may save both lives. But the future sometimes seems a long way off. “At least a dozen women with ovarian cancer have called me, and I can hear the tears on the other end of the phone after I tell them I can’t give them taxol,” Howard said. Perhaps the future isn’t too far away.
Who Has the ‘Right Stuff’?  
It Takes More Than Grades

AS SPRING APPROACHES, MASSES OF prospective freshmen huddle together on Cornell's campus, listening inattentively to their tour guide's cheerful voice explain Cornell's colors. But, instead of seeing red and white, visions of donning Cornell sweatshirts and striding confidently up McGraw Tower to hear "far above Cayuga's waters" being chimed dance in their heads.

The guide changes subjects to talk about Cornell's great academic past and promising future. Images of interviews, SAT's, and applications race through their minds, and then wonder what name will actually decorate their clothing next year. "Do I really have what it takes to get into Cornell?" they ask themselves. "Do I have 'The Right Stuff'?"

But who does have "The Right Stuff'? Most Cornell students and pre-frosh do not know exactly what the admissions office looks for in an appli-
cant. Some claim that the admissions staff weight SAT's the most. Others say it is rank in class or extra-curricular activities. These rumors float about Cornell like the legend of the statues of A.D. White and Ezra Cornell shaking hands. But what criteria do the admissions staff actually use to determine who will be in the class of 1995, and why do they use these criteria?

"When looking at prospective students we consider a variety of factors," said Richard Church '64, director of admissions for the College of Agriculture and Life Sciences. "We feel that the most important ones are strong grades and academic preparation, high school performance and rank in class. But, tied in with these and just as important is appropriateness—how good a match between a student's interests and what we have to offer." For example, someone seeking training in physical therapy would be advised to go somewhere else because Cornell does not offer that specific major.

Appropriateness flows over into checking for students with an aim in their academic pursuits, Church said. "We're looking for focused and directed individuals, not someone who's totally undecided. We want students who have determined their plan of action and see Cornell as a way to continue that plan."

Church claimed that the ag college places so much emphasis on appropriateness because the college is more of a professional school, and focused students reap more benefits from their classes. "Our goal in the class of 1995 is to get the approximately 650 students divided into the right number for each major."

In addition to appropriateness and high school performance, David L. Call '54, dean of the College of Agriculture and Life Sciences, said that when evalu-
ating applicants, "We're also looking for leadership capacity and the ability of the student to play a useful role in society. Is the person a leader or a follower?"

Susan Murphy '73, dean of admissions and financial aid for Cornell University, said that the admissions committees in each of the colleges check for leaders and students who can make a difference. "We're looking for students who've contributed to the community in some way—whether it be school, home or church. She hopes that students possessing this attribute will, upon arriving at Cornell, continue to have a beneficial impact on the community, and then go on to "make a significant contribution to the world."

However, just because an applicant possesses this attribute does not necessarily mean he or she will be admitted. The admissions staff immediately weed out students whose transcripts are "peppered with C's" or whose written application is poor. "A couple of years ago," Murphy said, "a very good academic student applied, but he misspelled 'agriculture' throughout the application."

While some students immediately find themselves searching for another college, others promptly receive an acceptance letter from Cornell. "Students that get quickly 'weeded in' show us they have it all put together—a challenging curriculum in which they did well, significant contributions to the community, a wonderful application..."
and evidence that they'll make a difference. You say to yourself, "This is a very good high school senior," Murphy explained.

All these varying criteria appear confusing, so why not just use grades and SAT scores? Church claimed that the way the ag college chooses students allows for the admission of only the best. "If you have the opportunity like we do to be a selective school, academic achievement seems to be a normal thing to make assessments on." But Cornell is not a normal school and neither is the admissions process.

"Course grades and standardized tests are important," Murphy said. "I'd be lying to you if I didn't tell you that."

Murphy later added, "If you compare only SAT scores with our Ivy League peers, Cornell doesn't rank as high. But we look at other measures of success; our students are tremendous."

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Cornell's admissions process also yields a diverse student body, Murphy claimed. "Every college in the country uses the term diverse, but Cornell really is diverse—ethnically, geographically and academically." In addition, the process picks out motivated students. "The one quality that I see among all Cornellians is high energy. They can handle challenging academics and contribute to the community."

Tanya Walter '93 agreed. "My view of the sophomores and freshmen is that they're ambitious, but they're so diverse that it's hard to pinpoint the typical Cornell student."

The "typical Cornellian," if one exists, has not changed much because Cornell has basically used the same determining criteria for the past 20 years. "The only thing we've really seen change is an increase in competitiveness and selectivity," Church said. "More students are applying but there's not an increase in the number of available spaces."

Murphy agreed, citing that in the fall of 1971, 13,063 students applied for a class of 2,950. But, she also believes that the applicant pool has changed slightly. "From 1971 to 1991, I've seen a broader geographic, ethnic and gender mix occur."

A special breed of students has emerged and continues to emerge through Cornell's selection process. "They have the ability to contribute to the community while growing intellectually and personally," Murphy said. "It's not just me, me, me. They're interested in their own pursuits while at the same time being involved in other activities, and they also have the ability to work together."

"The tradition will continue," asserted Church. "This year I've seen as strong a group of applicants as ever."

Call predicts that the class of 1995 will be a group of motivated, academically strong young people who have demonstrated leadership. But, it will also be a group of people with diverse interests.

And according to Murphy, "The class of '95 will be 2,950 energetic, bright individuals who will challenge the classes of '94, '93 and '92."

So, the next time you slip on your Cornell sweatshirt or hear your alma mater, smile because you have the "The Right Stuff." —

by Stephen Will '92
"It's really beautiful up here, even in February," said Lewis J. Staats, describing the 4,000-tap sugar maple bush he manages at Lake Placid. Owned and operated by Cornell University, the sugarbush is a research station little known to many Cornellians, but renowned in the maple syrup industry.

The Uihlein Sugar Maple Research-Extension Field Station is a rich source not only of natural beauty, but also of active, industry-minded research. Established in 1965 through the generosity of Mr. and Mrs. Henry Uihlein II, it has a reputation for excellence in maple syrup research.

"All the research done there is applied research, intended to be used in the industry. This fits right into the land grant mission of the College," said John W. Kelley PhD '68, director of the field station, and professor in the Department of Natural Resources.

One such industry-focused project involved development and evaluation of a vapor compression evaporator (VCE) as a more economical substitute for the open pan evaporator currently used to boil sap down into syrup. The main difference between the two evaporators is that, in the VCE, the steam produced from boiling the sap is captured, compressed and reused as energy, Kelley said. In open pan evaporators, this steam is lost.

The VCE removes about 90 percent of the water in sap. Then, to get good maple syrup color and flavor, the less energy-efficient open pan evaporator is used to remove the rest of the water.

Even though the VCE system makes use of an open pan evaporator, it is still far more efficient than open pan evaporators alone. Now, about half of the typical syrup producer's total costs come from the energy needed to run open pan evaporators, according to a 1989 paper by Kelley and Staats on the VCE. With the VCE system producers will be able to cut their energy costs by eighty percent.

The VCE also lessens the problem of balancing sap accumulation with sap deterioration. All evaporator systems need a certain quantity of sap to be run most efficiently. However, sap flows in maples at irregular rates, and unprocessed sap cannot be stored more than a few hours without deteriorating.

In the VCE system, high operating temperatures sterilize the sap as it is concentrated. The sap can then be stored for up to seven days without any loss in quality, Kelley said. "We haven't had any major problems in working with the VCE system. Our only real concern is that the unit has not been manufactured on a commercial basis yet," Staats said.

The field station is by no means limited to testing new equipment. A substantial part of its research involves the sugar maple itself. "The typical producer gets caught up in technology of sap collecting and processing, and doesn't spend nearly as much time thinking about where the sap comes from," Kelley said.

Currently, the field station is conducting a study with the U.S. Forest Service to determine if the sweetness of sap is hereditary. The sweeter the sap, the less needed to make syrup. In New York state, sugar maple sap has an average sugar content of 2 percent. Trees producing sap above this average are considered superior.

In the 1960s, the Forest Service identified superior sugar maples in six states by comparing sap sweetnesses of neighboring sugar maples over several years. The Forest Service then collected seeds and clonal material from the superior trees and started a breeding program, Kelley explained.

Cornell established two plantations of these superior sugar maples at the Uihlein field station in 1983. One contains their offspring, and the other consists of clones of the original trees made through grafting and root cuttings.

The trees, now about one inch in diameter, will be tapped during the 1991 sugaring season using a micro-tap technique to determine their sap sweetness. The percent of sugar a tree has at this size is a fairly reliable indicator of what it will be at mature size, Kelley said.

The preliminary data suggest that sap sweetness is heritable. If the final results concur, Cornell will start a breeding program to increase the state average of sap sweetness.

Research is the major function of the Uihlein field station, but the syrup they make is a sweet benefit. Most of the 1,200 gallons of maple syrup the field station produces annually is sold in Ithaca at the Cornell Dairy Store and the Cornell Orchards. The rest is sold worldwide through the field station's mail-order business. "A lot of our most important customers are alumni," Kelley said.

The plastic white and red maple syrup jugs are unmistakably Cornell. The Cornell emblem and the line drawing of researchers tapping maples are the most eye-catching features, but what Kelley said best captures the essence of the Uihlein field station is on the back: "Receipts are used to support sugar maple research and extension programs."
Health Foods:
Don’t Believe the Hype

NOT TOO LONG AGO, HEALTH FOODS were the mainstay of Mr. and Mrs. Granola, who wore tie-dyed shirts, rainbow headbands, and bell-bottomed jeans. Now, the craze has caught on with the children of the flower children, and this has become a land of health-conscious eaters.

Or has it?

We may believe that by eating Tiger’s Milk bars and taking mega-vitamins, we will look and feel like super heroes, but in many cases consumers are being duped. In the September 24, 1989, issue of the Detroit News, dietitian Beth Lyman was quoted as saying, “A lot of health food store products contain labeling that says they are more nutritious or more healthful but that’s not necessarily the case.”

New York State Department of Health’s Health Food Primer indicated that “… approximately 40 million Americans use fraudulent health products each year.” And it warned that some of the most common forms of health fraud include “false nutritional schemes.” Consumers were also advised to watch out for buzzwords such as “natural ingredients” that often disguise unproven health claims.

Not only do manufacturers claim that their products contain natural ingredients, but also that they are organic. A report by the Institute of Food Technology said that all food from a vegetable or animal source is technically “organic”; this simply means that the food “… is derived from a living organism and contains carbon in the chemical structure.” There is no federal definition or standard for “organically-grown” foods, the Institute reported, nor is there regulation of the use of the term “organic” on food labels.

In the October 1990 edition of the Cornell Cooperative Extension Consumer News Service, Metta Winter wrote, “Surveys show that consumers believe organic food to be safer and healthier, and they at least say that, in spite of its higher price, were it more readily available, they would buy more.” The Institute of Food Technology’s report, however, said, “The claim that organically produced foods are nutritionally superior to conventionally grown foods has not been scientifically established.”

David Harpp, a visiting chemistry professor in the College of Arts and Sciences, is somewhat skeptical about the labels “health food” and “health food store.” He believes that some so-called health foods, especially herbal teas, may actually cause health problems. “This is a fad that is highly problematic,” Harpp said.

Harpp also noted that it is frighteningly easy to go into a health food store, describe a health problem, and receive advice from proprietors. The American Diet Association (ADA) agreed. In the January 1989 issue of Nutrition Forum, Claire Aigner RD, MS reported that the ADA was “… collecting case reports of people harmed by inappropriate nutrition advice from bogus ‘nutritionists,’ health food store operators and others.” From 1986 to 1988 about 100 such cases were documented. Aigner added that health food store operators could be prosecuted for illegally dispensing “medical” advice. Giving such advice could also violate drug laws.

A 1985 article in the Salt Lake City Tribune quoted natural food store manager Ernie Shelton as saying, “Buying this [natural] kind of food is an investment … it is placing an emphasis on maintaining good health.” But Harpp is not convinced. Harpp’s idea of a truly healthful diet? Eat a variety of traditional foods, minimize salts and pickled foods, avoid overcooking vegetables, and reduce fat intake. He also advised eating favorite foods in moderation.

When it comes to deciding where to shop and what to buy, Harpp said that people “… stress themselves out …” over food additives that have not been proven harmful. And, he added, many “natural” foods have “natural” additives.

So, the next time you jog over to the health food store for an energy bar or some carob-covered nuts, take a closer look at the nutritional information. You may do just as well if you keep jogging and get a Snickers.

by Olugbemisola Amusa-Shonubi ’91
A CORMORANT FLEW LOW OVER the water's surface. It was searching for food. After spotting something, it dove down into the water only to come up coated with a layer of oil. The oil soaked its plumage and the bird's feathers lost their impermeability. The cormorant grew cold because it could no longer insulate itself, and tired because it had lost its buoyancy. For days it drifted, and all the while it ingested and inhaled toxins from the oil which damaged its respiratory, digestive, metabolic and excretory systems.

The amount of biological damage an oil spill creates in an environment depends on the characteristics of the spill and of the environment. In assessing the impact an oil spill, such as the recent one in the Persian Gulf, will have on the environment, factors such as the species of organisms involved, the chemical composition of the oil, the location of the spill and the climate are sometimes more important than the magnitude of the spill itself. Animal life comes close to disappearing from a heavily oiled ocean floor. A full recolonization recovery can take from five to ten years.

An oil spill does some of its greatest damage to birds that dive for their food, such as penguins, auks, cormorants, grebes and sea ducks. Birds that come into contact with oil can die from being waterlogged and also from the toxins that pass through their skins. They can also develop hypothermia and become dehydrated due to the lack of drinkable water.

Research by the Natural Environment Research Council found that those birds that make contact with the oil but are lucky enough to fly can still bring the oil back to their nests. Eggs are polluted when toxins that interfere with respiration are absorbed through the shells. Such eggs will fail to hatch.

Birds and aquatic life are affected in the worst by oil spills because their habitats and the food sources they rely upon are altered greatly. Animals such as dolphins and whales might be able to leave the area. "Some fish may also escape direct contamination but they will most likely receive toxins by consuming contaminated organisms," said Professor James W. Gillett, who teaches a course called ecotoxicology in the Department of Natural Resources.

"Some chemicals, however, are organoleptic," said Gillett, meaning that they can be perceived by a sense organ in an organism. Animals are able to detect food sources tainted with these chemicals and will avoid those that are foul-tasting. Sea animals are more sensitive at detecting tainting than humans. Stephen James Lewis, in his 1982 thesis on the effects of oil spills on birds, said experiments have shown that some birds like mallards and red phalaropes are also sensitive to tainting and can detect oil once they encounter it.

Animals not negatively affected by oil include marine turtles, which have been known to feed on tar. Other animals that have a natural coating of mucus (such as the sea anemone) can survive because the oil won't stick to them. Algae also have this advantage, but heavy spills will temporarily wipe out seaweed, said David K. Bulloch, in his book The Wasted Green.

The amount of damage an oil spill inflicts on an environment is related to the type of oil spilled. Crude oil, the kind dumped in the Gulf, is more toxic to certain species than diesel fuel, a refined oil, said Gillett. Crude oil triggers phototoxicity in daphnia and other invertebrates. Phototoxicity is the ability of light to form a toxin in an organism's body. Fish that feed off these organisms will starve when their prey are killed through phototoxicity. Even if their prey are not killed, the fish will obtain the toxin when it is mobilized from the prey into their digestive systems.

The polynuclear aromatic hydrocarbons found in crude oil are particularly persistent in the environment, said
Gillett. Organisms that contact the water's surface, like cormorants, are more physically affected by the thick, persistent crude oil than the more soluble fuel oil.

Much of the oil in the Gulf spill will form tar balls that will sink to the bottom. These tar balls will then become colonized by organisms, like mussels and coral, as if they were rocks, said Gillett. Made of large molecules that do not biodegrade quickly, tar balls can last for decades.

Spills in the open ocean (or a waterway like the Persian Gulf) have less of an ecological impact than more shallow, enclosed areas such as harbors that can't clean themselves out as easily, said Lewis.

In warm climates, the toxic elements in oil can be lost quickly. Gillett said that many of the toxic chemicals evaporate off the water's surface, reducing the oil to almost harmless residues. But at lower temperatures the oil may persist longer and rough weather will cause it to form "stable water-in-oil emulsions known as 'chocolate mousse,'" according to the Natural Environment Research Council. These emulsions will remain for long periods of time without dispersing.

The wind and the tide can worsen the damage. Oil spilled in one place will drift downwind and form a long slick that flows with the wind, collecting all of the birds swimming ahead of it and trapping them against the shore or against a passing ship.

When oil comes ashore and mixes with sand it can persist in the environment for up to thousands of years because the sand is not rich in organisms and nutrients that can degrade oil. But the sand in the ocean that gets bounced around by the tide can actually grind the tar balls, said Gillett.

One method used to combat oil spills is to burn them. "When the slick is burned, some particles go up into the stratosphere and are broken down by ultraviolet light," said Gillett. "Others become dust particles and re-enter the environment in rain."

Another method is using dispersants, nontoxic, biodegradable detergents which break up the thick, physical layer of oil on the water's surface. Although toxin exposure is lowered by using dispersants, the toxicity of the oil is not reduced.

In addition, applying nutrients to the seashore can stimulate organisms to grow on oil. Certain bacteria can be introduced onto the oil's surface and actually biodegrade the oil.

For the Gulf spill in particular, sunlight helps degrade it and winds from the southwest have helped to disperse it, said Gillett.

The Gulf spill may not directly affect areas outside a radius of ten miles, but indirect effects may include great production losses in marshes and other shallow waters that make good breeding grounds. Fish and invertebrates that lay eggs in these waters are very vulnerable to oil pollution. The spill in the Gulf may cause acute toxicity but may have less damaging effects than some lower level but chronic spills that have long term effects on organisms, populations, and the availability of nutrients.

"We can't predict how big the impact will be," said Gillett. "That's anybody's guess. This could have very long-term effects. Like the war, it's a stress on the environment that's no worse than some and a lot worse than others." 

by Susan Green '92
Continued
Education
Worldwide

For many people, graduation from college means a swift change. A door closed on an old way of life and a door opened on a new world of opportunities. Many are eager to put the long lines for registration and even longer walks to class behind them. But some cannot abandon the allure of fellowship and learning with fellow Cornellians.

Cornell's Adult University (CAU) was founded with this in mind. During CAU's first year in 1968, the program consisted of one class held in Ithaca for one week. Since then, the program has developed into one of the country's largest alumni colleges, with four one-week multi-class sessions in Ithaca during the summer and over 25 educational vacations in the United States and throughout the world every year. About 2,000 alumni and friends register for CAU every year and over 100 faculty teach classes in subjects ranging from fine art to fine wines.

But what is the allure of CAU? And why has its popularity grown so much over the past two decades?

"Our purpose is to provide ways for faculty and alumni to meet one another and learn together," said Ralph Janis '66, the current director of CAU. "Many people think that there is a contradiction in terms between 'education' and 'vacation', but it's actually a very natural combination."

Some participants find the "natural combination" on Cornell's Ithaca campus during CAU's popular summer program. Others, however, wish to pursue their interests outside the halls of Ivy.

The off-campus programs began in 1970 as short weekend trips, but by the late 1970s they had developed into what are now known as "study tours," so named because many of the trips now span several weeks.

Participants have taken trips to such varied places as Antarctica, the Galapagos Islands, Egypt, Central Asia, India and East Africa.

"Our choices for locations are based on a number of things," Janis said. "The interests and experiences of various faculty play a major role. We also get hundreds of ideas from past and current participants. We even do our own investigation into places we think might be of interest."

Sometimes the trips may be more adventurous than the participants expected. One group went to Egypt just days after the Achille Lauro hijacking.

"The people in Egypt were actually a lot friendlier than we thought they might be," Janis said. "They are so eager to maintain the tourism business that they made us feel more welcome than they probably would have otherwise."

Another group, on a trip to The Gambia, found themselves paddling a sinking fleet of dugout canoes in an effort to reach an island in the middle of a river. The river, as they learned halfway across, was filled with alligators.

Janis, however, is quick to point out that CAU does not emphasize travel to exotic locations. In fact, most of their off-campus trips take place in the United States. Recent trips have included studies of cultures in the upper Rio Grande Valley in New Mexico, investigations of life in the Florida Everglades and a series of short programs at Cornell's Shoals Marine Laboratory in Maine. "There is just as much to learn in Arizona as there is in France," Janis said.

Recent events in the Middle East may result in a larger concentration of these domestic programs, Janis said. A trip to Turkey was canceled and several trips to Europe have been delayed until the situation becomes more stable.

"We won't go anywhere that the State Department thinks is dangerous," explained Helen Hamilton, associate director of CAU. So far, the situation in the Middle East has not affected program registration, "but we are extending the deadlines for cancellations," Hamilton said.

"We won't have any programs where there is a problem," Janis explained. "There are a lot of domestic trips still planned and there are many places to go that aren't anywhere near the Middle East."

And what will this "college after college" offer alumni and others in the future?

"We keep asking ourselves: are we offering a range of programs in many different fields at many different price ranges?" Janis said. "We want to maintain contact between alumni and the University."

"In the future, I hope that every alumnus and alumna will at least know that the program exists," Janis said. "We want people to realize that four years is just not enough time to discover all of the wonderful things that Cornell University has to offer."

by Tim Whitney '91

Professor Howard Evans snorkeling in St. Croix.
WHEN STUDENTS ENTER CORNELL, they are supposed to enjoy the “only week of sun in Ithaca,” spend days having fun while getting to know the other new students that seem to be everywhere, and settling into the dorm. Unfortunately all new students do not have this experience. About 250 students—both transfers and freshmen—entered Cornell in January 1991, and have had a different introduction to the University.

In January, new students were greeted by little sun, even less warm weather, far fewer sharing their plight, and difficulty registering for classes.

The seven Cornell undergraduate colleges enrolled a total of 239 students in January, with each college welcoming anywhere from a single student to 90, according to the Cornell University Office of Undergraduate Admissions.

Being a January transfer or freshman is not that easy, according to Derek Meierbachtol ’94. “The most evident problem is that it’s difficult to get into the swing of things,” the January freshman said. “When we came in, everyone already was in their relationships and had all their friends. It’s hard to press your way in.”

January freshmen and transfers also find the academic pace of Cornell to be a challenge. Donna Myers ’93 said her chemistry class has been difficult and made her realize the prerequisite course at her former college was not up to par with Cornell’s. “I’m realizing there is more that I should know but don’t, so I’m having a lot more work added on just to catch up,” she said.

Meierbachtol explained there are other problems for him as a freshman. “I had no idea what it was like to go away to school and live in a dorm,” he stated. “As a freshman, I’m having the same problems making the transition as every other freshman has had. But by now they [the freshmen that entered during August] have already found their niche.”

Julie Oratovsky ’93, a transfer, explained that despite the problems faced, the struggles are worthwhile. “Obviously people weren’t happy where they were, so you know things can only get better,” she said.

But Meierbachtol takes solace in knowing he was up for the challenge of coming in mid-year. “From what I understand, they [the admissions office personnel] look at specific people to see if they can handle going in as January freshmen,” Meierbachtol commented. “There’s a lot to adapt to and not everyone could cope.”

January freshmen received admission to the University provided they enter during the second semester. Transfer students, on the other hand, applied to enter during the second semester, or simply did not meet the deadlines for fall registration.

“When I applied, it was too late to get in for the fall and I wanted to come as soon as I could so I didn’t wait for next fall,” explained Amy Tangorra ’93.

Once the new students arrived on campus, there was a week of orientation events to help assimilate them to Cornell life. Gloria Lee ’92, co-chairperson of the Orientation Steering Committee, said about 50 orientation counselors (OC’s) were on hand to aid the new students. “The main focus of training the OC’s was to emphasize that January students have different needs,” Lee commented. “There’s a smaller number than in August and they are spread throughout campus.”

New students who participated in the orientation program praised the program for its usefulness. “Orientation was helpful,” Oratovsky said. “I was able to spend a lot of time with other transfers.”

Stacie Heck ’93, who came to Cornell in January 1990, explained that often the students who come in during January hang out together, partly as a support group and partly because it is harder to meet students who have already been at Cornell. “From what I’ve seen, January people are a lot closer, they need it more,” Heck stated. “Even though you fight it...it turns out you are better friends with the people in your same position.”

Since about half of the new students do not live on campus, it was hard for the orientation staff to get in touch with them, resulting in some students jumping into Cornell life on their own. Myers, one of those students, chose to live in an off-campus apartment, which has been a barrier in meeting people. “If I lived in a dorm, I’d have met more people,” Myers related. “It is going better now. I’ve met some friends in my classes.”

Other students also did not have an active role in orientation because they chose to rush Cornell’s Greek system. “Jumping into rush was overwhelming, but it got me into campus life,” said Liz Allen ’93. “I learned a lot about the campus and now being in a house has been helpful. There are older sisters always there to answer questions.”

Adjusting to Cornell has been no problem for some students while it has required great determination for others. But most realize the experience has been meaningful. “The struggle is going to help me grow as an individual and help me grow independent,” emphasized Myers. “I have to rely on myself and be more in touch with everything else going on.”
MATTHEW HENDERSON '91 WAS LYING on the arts quad one sunny morning during September 1990 enjoying the weather. Suddenly someone approached Henderson and urged him to get up off the ground. The concerned passerby informed Henderson that he had been lying on poisons.

Henderson, along with dozens of other students, did not notice the yellow 5½-inch by 8½-inch signs scattered across the quad which read: "Persons are cautioned not to enter this property. Pesticides have been applied on September 28 . . ."

This early morning pesticide spraying raised concern across the Cornell campus about the potential dangers of lawn care chemicals and pesticides in general. Petitions with hundreds of signatures were sent to the administration urging the University to discontinue the use of toxic chemicals on Cornell grounds. Concerned students, faculty and parents wrote letters to the University and to local publications such as The Cornell Daily Sun and The Ithaca Times.

At the heart of the issue is the following question: are pesticides safe to use on campus grounds?

Professor James Gillett, an ecotoxicologist in the Department of Natural Resources said, "If they are done properly, pesticide sprayings do not pose any danger to the Cornell community. Very small amounts of pesticides are used and they are applied infrequently.

In addition, Hal Craft, associate vice president of Cornell's Facilities and Business Operations, does not feel that the sprayings put anyone in danger. In a letter to a student's mother who had complained about the sprayings, Craft wrote: "Cornell's Office of Environmental Health and the Gannett Health Center have advised that, during the two week period following the [September 28] lawn treatment, there were no known cases of pesticide-related health problems reported to them. Nor should we have expected any."

Responding to Craft's statement, Sue Eisenfeld '92 said, "People might not go to Gannett because the symptoms of pesticide contact are not that unusual. Headaches, for example, are fairly common things. People might not realize that a pesticide was responsible for their discomfort." Eisenfeld is a member of the Cornell Greens, a campus environmental group. Within the Greens, she works on a sub-committee which specifically seeks alternatives to pesticides on campus.

John McGroarty grad, also a member of the Greens, added, "I am more concerned with the long term effects of the pesticides. I do not want to worry about the possibility of getting cancer from pesticides. Also, I do not want my future children being born with birth defects."

Gillett said that the risks associated with pesticides are infinitesimal. He also said that if one supposes maximum contact (i.e. rolling around in the grass) with the chemicals used in the September 28 spraying, the cancer risk is something like $10^{-10}$. "This is like the chance of the sun falling out of the sky," added Gillett.

Cornell maintains that it only uses pesticides approved by the Environmental Protection Agency. David Nutter, an environmentalist, does not think E.P.A. approval is always meaningful. He wrote a letter to The Ithaca Times which was highly critical of Cornell's pesticide policies.

Nutter wrote: "The fact that the E.P.A. has not yet banned a substance does not prove its safety. Many of the most heavily used agricultural chemicals—including lawn treatments—are known to be hazardous to people and the environment, yet they are still on the market because of litigation and lobbying by those who profit from their sale, the slowness of an overburdened, underfunded E.P.A., and the assumption that applicators can and will prevent exposures to people and the environment."

Nutter recommended in his letter that, as a last resort, the University should adopt Integrated Pest Management for any documented pest problems. I.P.M., which is used by the University in most situations, is a goal oriented program which uses a combination of selected pesticides, cultural practices and careful timing to eliminate pests.

I.P.M. minimizes the use of pesticides by limiting their use to specific locations where a specific pest has been identified. Gillett said that I.P.M. is
probably the “safest, least expensive and most efficient method of controlling pests.”

Despite the scientific evidence that “proves” that pesticides—when properly used—are safe, there are still many people who do not want pesticides added to the environment. Henderson said, “When you introduce pesticides, you are tampering with the environment and the many complex processes within it—such as the food web. I don’t think scientific studies can predict all the effects of pesticides. There are just too many variables to consider.”

Another student, Karen Murray ’91, feels that pesticides are an unnecessary risk. “Using pesticides is like getting a face-lift. Sure you might look better, but it’s something you could do without. Pesticides might help make the grass more attractive but I could live with a messier, more natural, and pesticide-free environment,” she said.

The University has responded to the concern over the use of pesticides for “cosmetic” purposes. The Cornell Grounds Department has been instructed to run a more conservative program. This means that Cornell will be using even less pesticide for “cosmetic” reasons than is recommended by I.P.M. However, to many people’s dissatisfaction, the University said that it cannot ban the use of all pesticides.

Dennis Osika ’64, the superintendent of the Grounds Department at Cornell, said that he follows the principles of an I.P.M. program as well as the advice of faculty in the College of Agriculture and Life Sciences. “Faculty in the ag college have been teaching students about pesticide use for years. It would be hypocritical for a university to teach one method, yet practice its own affairs differently,” Osika said.

Members of the Greens have suggested many alternative methods of maintaining the lawns on campus which do not involve “dangerous” chemicals. One suggestion involves using herbicidal soap—instead of a more poisonous product called Roundup—to maintain sidewalks and gutters. The University said that it will experiment with the soap, but it cannot guarantee a total elimination of Roundup.

The Greens have also proposed that the University create work-study positions for students to pick weeds by hand. Osika feels that this would not be as cost-effective as using pesticides. He cautioned, however, that “money is not the whole issue.” Safety, he said, is his number one priority. Osika, who often comes in contact with pesticides himself, feels confident that he is not putting himself, his workers or the Cornell community in any danger.

In a letter to a concerned parent, Craft wrote, “We must continue to recognize that an attractive campus is very important to a large number of students, faculty, staff, and alumni; our challenge here is to use the minimum amount of chemicals, properly applied, so that the campus looks ‘good enough,’ but not to overdo it.”

by Joshua Z. Kantro ’91
FULL OF OLD MAGAZINES, SKELETONS, and odds and ends, Jack Lambert's studio is a cross between a garage sale and an attic. Students sit at their drawing tables in a circle around the room. Before them lie purses, violins, jars, plants and books; a wealth of subject matter for them to capture on paper. In the midst of it all stands Jack Lambert, eyebrows raised, pencil in hand.

R. J. Lambert Jr. '50, professor in the Department of Floriculture and Ornamental Horticulture, graduated from the ag college as a conservation major. He received an MS in zoology and anthropology from the University of Michigan in 1951. He returned to Cornell two years later to teach freehand drawing and watercolor classes.

When class is in session, it is called "The Lambert Pump Company," a mythical corporation that sets a mood for the entire semester. Lambert is the "president" and his students are the "employees." There are few limitations and enormous benefits. Students are given project guidelines and a few pointers. They are also given the freedom to experiment with different media, including watercolor, pen and ink, pastel and pencil. Students are also free to try various approaches to drawing their subject matter.

"The classes offer the possibility of allowing people to gain techniques and skills," Lambert said. Such skills include creating drawings for magazine covers, advertisements and books.

Most students also find themselves having fun. In Lambert's class one never knows what will happen next. On a whim, he may pull out "The Lambert Pump," a symbol of the Lambert Pump Company. Built of masking tape, plumbing and copper wire by students of former classes, it is a machine with imaginary functions that serves as an example of how creative students can become. Another day, students may find Lambert nearly motionless, pipe in his mouth, seated in front of a constructed background of cardboard walls and studio furniture. He is posing for portraits, to be critiqued by the model himself.

Students come to the classes for different reasons. Some enroll to try new angles on techniques they already use, such as sketching or rendering. Others are there to learn some basic skills for their areas of interest, whether they be advertising art direction, scientific illustration or architectural drawing. In the advanced drawing class, students can concentrate on one specific medium or technique for the entire semester, such as pastel rendering or pen and ink sketching.

John Tornes '91 is a landscape architecture student who chose to study sketching techniques. "Jack Lambert is perhaps one of the most influential professors I have had to date. He possesses not only the ability to instill in his students his passion for creativity, but he can provide a clarity of explanation for even the most frustrating of techniques," Tornes said.

When Jack Lambert retires, the future of the freehand drawing and watercolor classes will be uncertain. For now, they remain an opportunity to draw freely and explore the possibilities of drawing media. Valued by many students, the classes provide opportunities which they may not be able to find outside the ag college.

"Students might not be able to take another drawing class while at Cornell," Lambert said. Other drawing classes are typically overcrowded or limited to those majoring in fine arts. Also, the experience just would not be the same. By giving students the freedom to experiment, Lambert creates the opportunity to let ideas take control.

Sunlight shines in the windows of Lambert's studio now. Soon spring will become summer and another group of students will leave the Lambert Pump Company. But, Lambert will be there in the fall semester, ready to set new minds free with creativity.
ONE HUNDRED YEARS AFTER ITS birth, Cornell's Department of Poultry and Avian Sciences is about to become extinct. The department is being redistributed through the College of Agriculture and Life Sciences, and the New York State College of Veterinary Medicine. With the disbanding of the department imminent, it is only appropriate that the department's history be recounted. It is a history rich in innovation and scholarship.

"It will be sad to see it pass from the scene," said Professor Richard E. Austic '63, the current chair of the department. "The department is the oldest of its kind in the nation and world-famous. It helped build the poultry industry into what it is today."

The program's founder was Professor James E. Rice 1890, who in 1891 taught the first course in poultry husbandry before leaving in 1893 to start a poultry and fruit farming business. Director Liberty Hyde Bailey called him back to Cornell in 1903 to name him assistant professor of poultry husbandry under the Department of Animal Husbandry.

During the summer of 1904 the department's first building was constructed and named Poultry Headquarters. It featured an incubator cellar, slaughterhouse, feeding room, offices and a museum all crammed under the roof of a two-story structure. By 1907 Rice was put in charge of the newly established Department of Poultry Husbandry. He had to wait until 1913 before a larger, more adequate building was constructed and named, appropriately enough, Rice Hall.

The early days of the department put a heavy emphasis on practicality. At the time poultry farming was seen as nothing more than a side hobby. It was Rice's intention to develop it into a profitable industry. It is because of this that he is referred to as the "father of poultry husbandry."

After Rice's retirement in 1934 there was a shift toward performing more research. The department program developed around four disciplines: nutrition, genetics, physiology and food science. These four divisions would all make huge contributions to poultry farming.

For instance, in 1937, three Cornell professors in the nutrition division, Herbert S. Wilgus, Leo C. Norris and Gustave F. Heuser, discovered that adding manganese to the diet of chickens and turkeys could prevent perosis, a crippling disease that affects poultry. At the time, perosis was a major problem for poultry farmers.

Physiology professors A. van Tienhoven and C. E. Ostrander successfully proved that a precisely timed two- to four-hour period of light was all that was required to promote normal egg production. And Professor F. B. Hutt, the second chair of the department, wrote Genetics of the Fowl, which is still considered the definitive text on avian genetics.

Professor Robert C. Baker '43 dominates the list of achievements in the field of food science. Baker developed 58 new poultry and egg products, almost 30 of which were tested in retail markets. Some of these products were chicken hot dogs, chicken sausage and hard-cooked egg yolk.

Will the department's disbanding bring an end to all this innovative research? Austic does not think so. "I think you'll see professors from this department continue to conduct research related to poultry for the next ten to twenty years," he said.

A little history will be coming to an end soon. But rather than mourn the loss of the department, Austic believes that now is the time to honor its achievements. "One way you can look at the disbanding is this: This department has helped build the poultry industry into what it is today. And now it's at the point where it can, in many respects, take care of itself. We've done our job."
IN DECEMBER 1988, A FEW DAYS BEFORE Christmas, a number of Syracuse University students boarded Pan Am Flight 103 in London, England. After having spent a semester studying in England and traveling through Europe, they were eager to return home to their families and friends back in the United States. They never made it. A terrorist bomb blew up the plane as it flew over Lockerbie, Scotland.

Three years after the Lockerbie tragedy, the United States found itself on the brink of war with Saddam Hussein and Iraq just as many Cornellians were planning to board planes with destinations all over the world. One question to decide. I think we made the final decision around four [in the afternoon] on the sixteenth of January," he said.

The decisions not to go abroad were based on several concerns, the biggest being terrorist attacks. As U.S. citizens in a foreign country, all Cornell students are possible targets for violence aimed at hurting the United States. Many study at institutions that are made up almost entirely of U.S. students and are housed in one or two buildings.

One such institution is the Syracuse program in Florence, Italy. Amy Richter '92 had been planning to enroll in the Syracuse program when she and her parents learned of bomb threat letters received by the school in Florence. "When we first heard about the threat letters in December, we decided that maybe I shouldn't go," Richter said. "But then we heard later on that maybe it wasn't a real terrorist group. No one seemed to have heard of [the group]. Students who were returning early from the program because their parents pulled them out said it was completely safe." Richter and her parents eventually decided not to take the chance, but not before trying to determine what was really going on in Italy.

The problem of getting accurate information about the status and safety of programs abroad was one faced by all Cornellians considering study abroad. Richter called the Syracuse program to get some answers, but the answers were difficult to find. "I wanted numbers. I wanted to know how many students had backed out and why. All that information was 'confidential,'" she said.

Cornell Abroad's policy had a different approach, according to its director, Urbain DeWinter. "We do not make the decisions for [the students]. We give them all the information we have so that they can make an informed deci-
to change daily. "When we talked to them on Friday, they said everyone was still going everywhere," she recalled. "On Monday, when I canceled my plans, they said that about four other people had already canceled. I couldn't even speak to the [SUNY] director because he was in a meeting discussing the possibility of canceling the program."

Obviously it was no easy task for these students to decide not to go abroad. Many had planned from the very beginning of their college, or even high school, careers to spend a semester or two in a country overseas. Some students canceled and returned for a regular semester at Cornell. Others became interested in the possibility of going elsewhere.

Lisa Lederman '92 and Lisa Sloe '92 were originally supposed to be in Spain this semester. When they and their parents decided that this was not a safe place to be, they called CU Abroad. Lederman said, "I said, 'Well, we're not going to Spain. Where else can we go?' And they said, 'How about Australia?'" For Lederman and Sloe, Australia it was.

Other students, knowing that they would have few other opportunities to study abroad, opted not to cancel their plans. Andrea DelDuca '92 had always wanted to spend a semester in Italy. She is now in Florence fulfilling that wish. Having made plane reservations far in advance, she left almost a full two weeks before the deadline for Saddam to leave Kuwait. "The first few days they warned us to stay in our apartment, things like that," she said. "But things are pretty normal now. We go out, we're careful."

Some students were already abroad when the Gulf war began, having arrived in September 1990 when the Gulf crisis was just beginning. For them, the main change has been increased security. According to DeWinter, EDUCO student is going ahead with his plans to study in Paris. Chris McCollum '93 said, "I'll go if I'm accepted. I don't think [the war] really affects my plans." Since he will be studying at a French university, he feels it will be easier for him to blend in. For him, there is no reason to be overly concerned, as long as adequate security measures are taken. "Most people think that by next year it won't be a problem," McCollum said.

McCollum's statement points out the possibility that by the time next year's programs begin, the war may be over. For Bayer, who still hopes to spend his summer in Paris, this would be a welcome turn of events. For Gyimesi and Richter, there remains the hope that they will carry out their plans to study abroad a semester late, though most likely only if the terrorist threat no longer exists.

Perhaps by next semester, the threat will be lifted, or perhaps students returning from abroad will be able to allay parent and student concerns. "There will be some waiting to see what will happen with the war in the Gulf. It's too soon to tell," said DeWinter. Until then, he said, "We suggest that students do not go to the Middle East, especially Israel and Egypt."

by Elizabeth Heaton '92
THE "MAGIC OF PESTICIDES," ONCE thought to be able to cure all agricultural ills, may do more harm than good. According to several recent studies, chemical pest controls seep into ground water, pose a threat to wildlife and public health, and cost billions of dollars in governmental regulations.

With over 700 million pounds of pesticides used in U.S. agriculture every year, cutting back poses a major problem for researchers and agriculturalists. A new Cornell study may shed some light on the solutions.

The study, which is now a chapter in the latest edition of the 2,300-page Handbook on Pest Management in Agriculture, suggests that substituting nonchemical techniques for chemical pest controls could reduce up to 50 percent of the pesticides used in the United States without reducing crop yields. The proposed reductions would raise the price of food by less than one percent, claimed David Pimentel PhD '51, who led the study and is a professor in the departments of entomology and agricultural sciences.

The idea for the study began when the government of Sweden invited Pimentel to help formulate a pesticide reduction policy in response to growing public concern over the effects of chemical pest controls. "Trying to reduce pesticides in Sweden made me wonder if we could achieve the same results in the United States, and if we could, what the costs and benefits would be," Pimentel recalled.

He and a group of ten undergraduate and graduate students in a course called environmental policy decided to research the topic further. "Our study looks at how we can reduce the major groups of pesticides—herbicides, insecticides and fungicides—in about 40 major U.S. crops," Pimentel explained.

Lori McLaughlin, a PhD candidate in the Department of Natural Resources, worked with Pimentel on the study. "Each person in the group concentrated on three or four crops," McLaughlin said. "We cited over three hundred papers on different methods of crop- ping. Based on those papers, we came up with the techniques and estimated costs involved in reducing pesticides."

Through their research, Pimentel and his students found several practical, economical and safe alternatives to chemical pest control. The Integrated Pest Management system is one of them. One part of IPM is scouting, or monitoring the pest populations of crops to determine the most effective time to treat, and can reduce up to 70 percent of the insecticides needed to treat peanuts.

"A lot of pesticides are applied on a routine schedule, whether they are needed or not," explained Pimentel. "When that is stopped, obviously pesticide use is significantly reduced."

One of the newest techniques mentioned in the study is a sex pheromone that works against the harmful grape berry moth. Studied for twenty years, the pheromone has become available to grape growers for the first time this season. The technique limits the need for pesticides by interrupting the mating cycle of berry moths so they cannot reproduce. "We have found this technique to be every bit as effective as insecticides," said Tim Martinson MS '88, PhD '91, a post-doctoral research associate at the New York State Agricultural Experiment Station at Geneva, New York.

Pimentel and his students also highlighted a variety of other pesticide reduction methods which are available to farmers. For example, rotating crops can reduce the build-up of insects, weeds and plant pathogens. And using viruses, bacteria, fungi and other natural enemies can reduce pests without harming the environment.

The suggestions made in the study could increase crop production costs overall from about $4 billion to about $5 billion a year. What this means for consumers is an estimated increase of 0.6 percent in food costs, a price Pimentel believes most people would be willing to pay to reduce pesticides.

However, this cost increase does not include the potential benefits to the environment and public health. "If you took those into account, reducing pesticides would result in a net profit," Pimentel stressed. The study claims that pesticide damage to the environment and public health, such as human and animal poisonings, costs about $2 billion to $4 billion a year.

Although Pimentel and McLaughlin hope that their study will encourage the reduction of pesticides through improved education, training and governmental incentive programs, they do not know when this will happen. "It is difficult to predict something like this," Pimentel said. "My general feeling is that it will take five to ten years before we see any major pesticide reduction policies adopted in the U.S. However, almost everybody is concerned about pesticides. The public wants these reductions now."
New Environmental Center Proposed

A new environmental center has been proposed by the Provost’s Committee on the Environment. The committee, co-chaired by Dean David L. Call ’54 of the College of Agriculture and Life Sciences and Simon Levin, a professor of ecology and systematics, submitted the proposal to Provost Malden C. Nesheim. From there the proposal will be put up for consideration before the Faculty Council of Representatives and the Board of Trustees. The new center would have three goals: to increase the Cornell community’s awareness of environmental issues through new academic programs, to increase campus environmental research and to provide assistance to extension programs outside the Cornell community.

Geneva Station Appoints New Professors

Cornell’s New York State Agricultural Experiment Station at Geneva recently appointed two new professors. Dr. Thomas Bjorkman was named an assistant professor of vegetable crops in the Department of Horticultural Sciences, and Dr. Richard A. Durst was named professor of chemistry and director of analytical laboratories in the Department of Food Science and Technology.

Bjorkman, a 1979 graduate of the University of California at Davis, received his doctoral degree from Cornell in 1986. He worked as a NASA research associate at the University of Washington before joining the Geneva station faculty in July 1990. He is responsible for the development of a research program in the physiology of vegetable crops that will enable scientists to better understand how different vegetables grow under a variety of conditions.

Bjorkman is a member of several societies, including the American Association for the Advancement of Science, the American Society of Horticultural Sciences, the American Society of Agronomy and the American Society of Plant Physiology.

Durst is a 1960 graduate of the University of Rhode Island and received his doctoral degree in analytical chemistry from the Massachusetts Institute of Technology in 1963. He has taught at MIT, Boston College and the University of Maryland. Most recently he was the supervisory research chemist and group leader of organic sensors at the National Institute of Standards and Technology before being appointed to the Geneva station in September 1990. Durst is designing and conducting a research program in analytical problems associated with food production and agriculture.

He has received a bronze medal for federal service from the National Institute of Standards and Technology and a silver medal from the U.S. Department of Commerce. He is also a member of the American Chemistry Society, the American Association for Clinical Chemistry, the American Association for the Advancement of Science, and several other professional societies.

Budget Cuts

Due to state budget cuts, Cornell faces the prospect of losing some $8 million in state aid within the next year, with up to $5 million coming out of the four state-assisted colleges and schools, including the College of Agriculture and Life Sciences. In response, the state-assisted colleges have issued 67 layoff notices and 30 other state-funded positions have been held vacant. Also, the undergraduate tuition for state residents may be increased to as much as $6,310.

Kelley Named Extension Forester

Professor John W. Kelley of the Department of Natural Resources was recently named by the Cornell Cooperative Extension as the New York State Extension Forester. Kelley’s education program will be aimed at teaching New York’s 500,000 private woodland owners how to thin a forest and how to harvest mature trees.

Kelley is also the director of the Arnot Forest, of the Ulhein Sugar Maple Research-Extension Field Station at Lake Placid, and of the New York chapter of the American Chestnut Foundation.

Honors

Professor emeritus Nelson Shaulis of the New York State Agricultural Experiment Station at Geneva was the recent recipient of the 1990 Award of Merit presented by the American Wine Society. The award was in recognition of his outstanding contributions to the advancement of viticulture.

The chair of the Department of Fruit and Vegetable Science, Professor Elmer E. Ewing, was awarded a lifetime membership in the Potato Association of America. It is the association’s highest recognition.
From Oregon to Oxford

IT SOUNDS LIKE A PLOT FROM A situation comedy: a kid who grew up tending cattle in Oregon goes on to study policy, politics, and economics at Oxford. Sitcoms aside, Wesley Sand '91 is living this story, thanks to the Rhodes Scholarship he was awarded in December 1990.

Sand, an animal science major in the College of Agriculture and Life Sciences, became only the twentieth Cornellian to receive a Rhodes Scholarship in the award’s illustrious 89-year history. If anyone expected him to be Cornell’s next Rhodes Scholar, Wes Sand was not one of them.

“I never thought I’d get elected,” he said. “I just didn’t think I fit in with the other applicants.” During the whirlwind interview sessions that rounded out the application process, Sand felt stumped by an alarming number of questions on politics and economics.

He admitted that he was at times “creative” in response to questions such as “Does everyone deserve a health insurance plan and how will you get it to them?” and “Off the top of your head, can you devise a national economic plan?”

“But if you truly didn’t know the answer to something, you just said so,” said Sand. “There was no way to fool these people.”

According to Sand, he owes his award to his father, who taught him the value of hard work. The lessons he learned while growing up on the farm have carried him through life to where he is now. “That was the atmosphere at home: everyone putting in long hours, all the neighbors working together,” he said.

Another major influence on Sand has been his advisor at Cornell, Dale Bauman, a professor in the Department of Animal Science, whom Sand calls “a fantastic advisor and a fantastic person.” Now a research assistant for Bauman, Sand met him after transferring from Oregon State University.

“Wes is a very outgoing individual, a bright young student, and a very capable young man,” said Bauman. “I was surprised to hear of his scholarship, but his excellent academic credentials, together with his personality, made him very well qualified for the award.”

The scholarship process began back in the spring of 1990, when Sand received a letter from Cornell notifying him that he might qualify for the Rhodes Scholarship. After sending in a personal statement and several letters of referral, Sand was then invited to attend the first round of interviews.

He survived two rounds and moved on to the regional level in Seattle, Washington, where four finalists were eventually chosen as Rhodes Scholars, an honor bestowed upon just 32 college seniors each year.

Upon arriving in Seattle, the finalists had a reception with the Rhodes committee. Although the setting was informal and he did have some interesting conversations with a few committee members, Sand still felt unworthy of the scholarship. “After the reception, I went back to my room and called my parents. I thought it was over,” he said.

It was not until the final round of interviews, where the committee asked personal questions, that Sand felt good about his chances. “Basically, I was saying, ‘This is Wes Sand. Take him or leave him.’”

And now, just a few months after receiving the scholarship, Sand eagerly anticipates Oxford, hoping some day to make a contribution to his community and perhaps the world.

“You know, you dream about a Rhodes Scholarship and about going to Oxford, and for a while I couldn’t understand why I got it,” he said. After asking one of the former Rhodes Scholars about the committee’s reasoning, Sand was told that he was “basically just an extremely nice guy.”

“I hope this shows that awards like this are open to all people who put their minds to it,” he said.

by Brett D. Mendel '91

New York State College of Agriculture and Life Sciences, a Statutory College of the State University, at Cornell University
Beak of the Puffins page 4
About the Issue

What are the students in the College of Agriculture and Life Sciences up to? Learn about their various activities in this issue of the Countryman. Read about debate club members, corporate interns, 4-H members, and duelers donning suits of armor to re-live the past. The Countryman also examines puffins, tagged crows, biodegradable plastics, and the award-winning bridle club.

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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, sexual preference, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.
WAKE UP AT NOON EVERY DAY. TAKE a day off every now and then, just because you feel like it. Wear jeans only in the office area. For most people this is the ideal career situation: you make the rules, you follow your own schedule and you work hard. For numerous entrepreneurs all over the country, this is their situation. Not surprisingly, many Cornellians would like to make it theirs too.

The Personal Enterprise Internship Program is designed to aid students in achieving that goal of owning or managing a small business. The program was established in 1987 as another facet of the Personal Enterprise Program, providing students with the opportunity to get hands-on experience in the small business environment.

Diana Mastel ’91, Intern Coordinator for the program, said, “Students spend eight to ten weeks during the summer in a small business, often working directly with the company’s president or CEO.” They learn about how the business works, get involved with the day-to-day aspects of running a small company and are often given a specific project to work on during the course of the internship. However, not everyone can be sent in to work with the CEO of a small company. Who would make a good intern? “We are looking for juniors, with an occasional senior, that are open-minded and eager to learn,” described Mastel. The program draws from a pool of interested students, many of whom have taken the Personal Enterprise and Small Business Management course taught by Professor Michael A. Hudson, director of the Personal Enterprise Program.

This course, once recommended and now required of all interns, teaches students about the operation of a small business. Hudson feels that it is an invaluable aspect of learning all there is to know about becoming an entrepreneur. “After they’ve gone through the course, then they’re ready to gain field experience [as interns],” he said. The course, which is taught in the spring, the internship and the Small Business Counseling course, which follows in the fall, provides a three-step program geared towards entrepreneurship. “It’s one year for a student to identify where [his or her] interests lie, get experience and come back and make a contribution,” said Hudson.

Apparently, the program is becoming more popular. “This year we have six times the amount of internships available and three times the students who are interested,” said Mastel. One such hopeful student is Laura Kenny ’92. “I heard about the opportunity when I took a course of Professor Hudson’s courses. He emphasized what a great experience it would be, and I became interested.” Now through with the application process, she hopes to hear from a company soon.

While Kenny waits, the participating companies are busy making their final decisions. The sponsoring small businesses vary greatly in both location and function. Students can find internships in a range of businesses from Challenge Industries in Ithaca, New York, to R&B Realty in Los Angeles, California, to Flavors and Fragrances in New York City. Many sponsors are Cornell alumni who, having been successful with their own small businesses, are eager to pass along their knowledge to students.

In turn, the interning students provide the participating companies with some welcome help. They have a student who can attend to specific projects or free up other employees to do more. “An intern can come in, take a project and spend eight or ten weeks working specifically on that one project,” Hudson said.

Many companies participate in order to offer students opportunities to learn, never realizing that they may get more out of the experience than the student. Gene Samburg ’63, as quoted in the Personal Enterprise Program Brochure, stated, “Although I originally thought that our company was doing students a favor by providing them positions, our experience has proved that we were just as much the beneficiary of the program as were the interns.”

For the students, the program has been nothing short of informative and invaluable. Their summer job duties are not limited to gophering, filing and entering data into a computer. Instead the jobs are challenging, résumé-building and interesting. Quoted in the program’s Guide to Intern Sponsorship, M. Mei Tschang ’89, said, “I learned about all aspects of the small business, from production to marketing and sales.”

Her experience is not unique, as many express the same view when commenting on their summer internships. And, though they may not have been able to set their own hours and dress code, the internship program is a big step towards achieving their goals of someday owning their own businesses.
Bringing Back The Puffins

DOES SPENDING YOUR SUMMER ON a rocky, unpeopled island 20 miles off the Maine coast in a 12-foot by 12-foot cabin with no running water, plumbing or electricity sound appealing to you? It does to the 24 interns and volunteers who participate each summer in the Puffin Project, spending their vacations feeding puffin chicks, observing bird behavior and chasing away uninvited gulls and people.

It is not hard to see how they become fascinated with the puffin, a pigeon-sized seabird from the auk family that looks like a clownish cross between an emperor penguin and a toucan and is immortalized on hundreds of souvenir items and no smoking ("no puffin") signs. The tern, a black-capped gray bird about the size of a robin, while not as wildly popular with the public as the puffin, is equally important to the Puffin Project people.

Co-sponsored by the National Audubon Society and the Canadian Wildlife Service, the Puffin Project was started in 1973 by Stephen W. Kress PhD '75 as an effort to restore the Atlantic puffin and Arctic, common and roseate terns to historic island habitats off the Maine coast. Human habitation of the islands and massive hunting during the 1800s caused sharp declines in puffin and tern populations there, and by the early 1900s, the birds were almost gone. Six of these islands are now designated sanctuaries and are part of the Puffin Project.

Kress, who works in the Laboratory of Ornithology, and his teams of summer interns and volunteers have brought back the puffins to Seal Island and Eastern Egg Rock by flying almost 2,000 chicks from Newfoundland's large puffin colonies to the Maine islands and hand-rearing them. Because puffins usually return to nest in the places where they were raised, the Puffin Project is based on the premise that the birds will eventually recolonize the islands on which they were raised.

However, merely being raised on an island is not enough for a puffin. Because puffins will nest only where other puffins are already nesting, Kress and his teams have to trick the birds by using wooden decoys and sound recordings of puffin calls to lure them to the islands. "Some of the returning puffins actually rub beaks with the decoys," Kress said.

The first Puffin Project puffins were raised at Eastern Egg Rock in 1973. The puffins first began breeding there in 1981, and by 1990, there were 15 pairs at Eastern Egg Rock.

The project was expanded to Seal Island in 1984. Puffins began returning to Seal Island in 1986 but not in sufficient numbers to hope for the start of a colony until 1989, when at least 13 puffins were visiting the island. But, the puffins have not yet begun to breed, said Kress.

A large amount of time is spent simply waiting for the puffins to mature. The birds spend the first two years of their life at sea. Then, they visit islands for the next two summers or so before beginning to breed. Once they are breeding, each pair only produces one chick a year.

In addition, puffins face a myriad of population-threatening problems, including oil spills and disturbance of nesting sites by humans and other animals. "Birds concentrated on a few islands are very vulnerable to catastrophes such as oil spills and disease," Kress explained.

This extreme concentration is especially evident in the terns, with 95 percent of Maine's tern population living on Puffin Project islands, said Kress. Most of that population is the result of the tern restoration program. In 1990, there were 1,232 pairs of terns on Eastern Egg Rock alone, according to the 1990 edition of the Egg Rock Update, the Puffin Project newsletter.

Like the puffins, the terns were restored using decoys and sound recordings. Chick-rearing was not a part, however, due to the difficulties of hand-rearing terns, Kress explained. The restoration techniques have been a success at four of the historic tern islands.

Today, the 1916 Migratory Bird Treaty Act protects puffins and terns from hunters, but not from natural predators such as herring and great black-backed gulls. These gulls not only eat adult puffins and terns and their eggs and chicks, but also compete for their nesting sites. And since gulls stay in Maine year round while the puffins and terns migrate, the gulls usually have first choice.

To reclaim the six islands for puffin and tern restoration, gulls already nesting there were displaced, primarily by the U.S. Fish and Wildlife Service. Because gulls, like puffins and terns, return year after year to the same nesting islands, once the initial population was gone, it was easier to keep the islands gull-free, Kress said. Currently, the gulls have about 220 islands in contrast to the puffins' and terns' six main islands.

Making the islands an attractive place for terns and puffins to nest takes a tremendous amount of work, and much of that work is done by the summer interns and volunteers, Kress said. Each summer, he hires a dozen full-time
student interns to live and work on the islands from late May to mid-August. An additional 12 volunteers spend two to three weeks on the islands each summer. All interns and volunteers are expected to have some basic knowledge of birds.

"Steve [Kress] is really selective in who he chooses. He makes sure you know exactly what you're getting into," said Anne Peterson, a fourth-grade Trumansburg schoolteacher who has been a volunteer the past two summers.

Peterson likes the Puffin Project because it means a few weeks without the basic amenities. "These islands are really spiritual places. You have time to reflect and get away from your everyday life. It's a magical place," she explained.

And being without the amenities gives people a different perspective. "You eat broccoli that's a little brown, and you really pay attention to how much water you use," she added, noting that the islands get groceries and supplies only every three weeks.

A typical day for a volunteer or an intern begins with a 6 a.m. count of the puffins, black guillemots, gulls, cor- morants and any birds not usually seen on the island, Peterson said. Fortunately, the couple thousand terns are not counted.

Two four-hour stints in the birdwatching blinds follow. These tent-like structures, complete with the luxury of padded buckets for seats, permit the interns and volunteers to observe birds without disturbing them.

One stint is devoted to puffin watching. Records of which puffins go into which nesting burrows and whether they bring fish into the burrows, a sign that they have a chick, are kept.

"It's a fun shift. A four-hour shift goes by so quickly. You get to record the antics of these comic birds and listen to their calls. Puffin calls sound like a chain saw being started up," Peterson explained.

The other four-hour stint varies from island to island. On Eastern Egg Rock, it is devoted to the terns. Last summer, a study of their feeding preferences was conducted. "You had to identify which bird had the fish, what species the fish was, how big it was and then which of the tern's two or three chicks got it, all in a matter of seconds," Peterson said.

In addition to these daily activities, volunteers and interns do everything from the tedious task of weeding tall-growth plants (terns won't nest in them) to the challenging chore of putting identifying bands on the legs of puffins and terns to collecting weather data.

Mitschka Hartley, a junior in the Department of Natural Resources, has also worked with the Puffin Project the past two summers as a student intern. "I got lucky," he said. "Most of the interns are either masters or PhD candidates. Very few are undergrads."

Hartley's first summer was on Seal Island, where he raised 200 puffin chicks. During his second summer, Hartley split his time between Seal Island and Matinicus Rock. "Matinicus is what Steve [Kress] would like all of his islands to be like," Hartley said. "It has successful populations of razorbill auklets, guillemots, puffins, laughing gulls and Arctic and common terns."

A significant part of the Puffin Project is the total immersion into the natural world, Hartley explained. "You start to feel like you're part of their families [the terns]." You get to know them, and when one of the chicks dies, it's kind of sad."

But just what is it like to be on such a remote island for 12 weeks? "Personally, it's a lot of fun. You learn a lot about yourself—there's a lot of inner reflection and soul-searching," Hartley said, echoing Peterson. "But when you hit the mainland (usually Rockland, Maine), you're psyched to get a soda and a pizza. And to do your laundry and take hot showers. Most people enjoy going to the mainland, if for nothing but to realize how good you had it on the island."

The interns typically work two to three weeks, from about 6 a.m. to 7 p.m. seven days a week, before having a couple of days off. "You work really hard. Everyone I know has been left with an incredible sense of accomplishment," Hartley said. "And the hands-on experience is unbeatable."

Despite the rigorous working conditions, the Puffin Project is something of an addiction for many people. "It's amazing how many people go back year after year. Most people can't stay away," Hartley said.

Apparently, neither can the puffins and terns. The long sought return of the Maine islands to their original diversity is well on its way to full realization. Seventeen years of hard work have paid off.

by Beth P. Goelzer '91
WHAT COMMON THREAD CONNECTS these scenes?: a doctor talking to a patient before an operation, a lawyer delivering a closing argument, an engineer explaining a new development to a board of directors, a student debating the ethics of war with a professor and a corporate manager presenting the latest stock reports via satellite to shareholders around the globe.

Trying to locate a similarity among these everyday occurrences may prove challenging, but you do not have to be Sherlock Holmes to uncover the element that weaves these events together. The solution to this mystery lies right under your nose.

"It doesn't matter what you do. Whether you're a manager, teacher, lawyer, student or doctor, you have to know how to speak," said Pamela Stepp MPS '80, a senior lecturer in the College of Agriculture and Life Sciences and director of the Forensics Program. Over the past ten years, academic institutions and the marketplace have been placing an increased emphasis on effective oral communication.

"Since 1980, the speech and debate program here at Cornell has been getting bigger and bigger. Ten years ago it was basically dead—I could only find two debaters. But now it's caught on and we have about 40 active members, and in 1988 [the Cornell forensics team] won first place in the nation in speech and debate," said Stepp.

The increasing popularity and importance of public speaking appears not only on Cornell's campus but also in the marketplace. "Communication is one of the sets of skills receiving more attention nowadays," said Charlotte Rosen, senior lecturer in management communications in the Johnson Graduate School of Management. "More emphasis is being placed on it [public speaking], and there's more of an expectation that people will do it well."

But why are schools and businesses now stressing public speaking? Recent research proved that oral communication skills "make the most difference in managerial effectiveness—if you can't communicate effectively you can't implement plans," said Judi Brownell, associate professor of management communication in the School of Hotel Administration.

Employees at all levels realize the importance of public speaking, because out in the business world, "You'll be communicating in all sorts of situations," said Rosen. "I can't think of any position where they [oral communication skills] are not important."

These crucial skills not only help managers and workers, but they also aid students. "Public speaking teaches you to use clear, concise language and the importance of structure," said Stepp. "Students say they're studying science so they don't need to know how to speak, but maybe someday they'll need to persuade someone to give them a research grant." At the very least, people living in a democratic society need to know how to speak in public to express their views, she added.

Dianne Walter, a demonstration program development leader for Tompkins County 4-H, emphasized the benefits of oral communication skills. "Even if you're never called upon to stand in front of a group, public speaking teaches you how to organize your thoughts. Personal communication skills are important no matter what you're called upon to do."

However, you could find yourself in front of an audience of millions. "In this age, public speaking is increasing in importance because of the electronic revolution in the media," said Ralph Thompson, a senior lecturer in the Department of Communication.

Public speaking can also reach people on a more personal level. "It helped me in every aspect of my life," said

Tanya Walter '93, the recipient of the 1990 4-H New York State Public Speaking Award. "It helped me communicate one-on-one and in various group situations. It was also a way to build my self-confidence."

While public speaking helps people in school, in the marketplace and in society, it can also give a competitive edge in the job search. "Employers of all sizes, types and descriptions always stress strong oral communication skills. I've heard it so many times that it sounds like a broken record," said Bill Alberta MS '77, coordinator of the ag college's Career Development Office. He talks to employers ranging from Fortune 500 companies to non-profit organizations to government agencies.

"They all consistently list oral communication as one of the most important hiring criteria for all different positions. The only occupation that I can think of where strong communications skills aren't important for is 'hermit.'"

Of course, most people live and work in society and, therefore, need to look under their noses to find the true value of oral communication. According to Stepp, "Public speaking works in the real world."

by Stephen Will '92
Up for Debate

by Brett D. Mendel '91

ON A TYPICAL THURSDAY AFTER-
noon, Jamey Dumas '91 hurries out of
class and into a borrowed van. With a
few other Cornell students, he embarks
on a 10- to 20-hour drive to a far-off
college. After a sleepless weekend of
speeches, arguments and rebuttals, he
makes his way back to campus as Sun-
day night fades into Monday morning.
He has three days to organize his life,
and by Thursday or Friday afternoon,
the cycle begins again.

Such is the life of a hard-core debater
from the Forensics Program at Cornell
University. Split into the two categories
of speech and debate, the forensics
team sends its members to tournaments
across the country throughout the en-
tire academic year, vacations included.

While the team is officially part of
the Department of Communication in the
College of Agriculture and Life Sci-
ences, any student can join and com-
pete as much as or as little as desired. It
just so happens, though, that the
prevailing background of debaters is
from pre-law studies.

"Debate is great preparation for a ca-
reer in law because you learn to for-
mulate arguments quickly, think on your
feet, and keep an open mind," said Lin-
da Coye '93, a debater since her fresh-
man year. She is double-majoring in
government and history with law
school ambitions.

"Debate requires a great deal of
quick, analytical thinking, just like in
law school or a law career," said Jeremy
Rosen '93, also a second-year debater.

"The large majority of committed
debaters wind up at top law schools be-
cause debate is extremely research
based," added Dumas. "There is a lot of
precedent material for the topics we
cover, and the research skills for the
team also apply to law." Former de-
baters have attended the law schools of
Harvard, Yale, Pennsylvania, Cornell,
Boston University, Syracuse and North-
western, to name a few.

But one need not have an interest in
law to participate in debate. Currently,
the team consists of students from vari-
sous colleges at Cornell, most of whom
have had little or no high school debate
experience. This is one aspect of the
team that separates it from others
around the country, said Coye, pointing
out that most teams consist of students
who have debated for three or four
years in high school.

Even so, the team has finished the
season ranked number one and num-
ber three in the country within the last
three years. Pam Stepp, the director of
the Forensics Program, has been in-
stromental to this success. "She has
been a tremendous fundraiser," said
Dumas.

The team receives money from
several sources, including alumni and
different parts of the University, said
Dumas, and Stepp has raised the neces-
sary funds to send members of the
team to as many as six different toun-
raments each weekend. Most of the
several hundred colleges that have de-
bate teams cannot equal Cornell's abil-
ity to simultaneously reach that many
tournaments, said Dumas.

Aside from the northeast region cir-
cuit, which includes trips to Plattsburg,
Poughkeepsie, Boston and Baltimore,
the team participates on the national
level as well. In the past, they have
made stops in the states of Kentucky,
Washington, Kansas, West Virginia and
Utah.

The team's monetary resources do
not cover all of their expenses, how-
ever. In many instances, Cornell Clubs
and individual alumni of different cities
have been more than generous.

"Without the Cornell network of
alumni, we wouldn't be able to go to at
least half of these places," said Coye.
"The Cornell Club of Philadelphia, for
example, arranged for our accommoda-
tions, and the alumni in St. Louis paid
for our flight to that city. The sponsors
have been incredible; they are critical
to our success."

So what drives debaters such as Du-
mas and Coye to go to sleep at five in
the morning on most days, abandon
their social lives, cram a week's worth
of academics and activities into four or
five days and spend almost every week-
end of the semester on the road?

"It's addictive," said Coye. "I get a
real high from arguing effectively, espe-
cially if we win."

Apparently, the debaters have found
a winning formula.

Victorious debaters after tournament: (top row, left to right) Justin Ward, Marc Kesselman, Alan Givens, James
Dumas (bottom, left to right) Brian Housh, Josh Berman, Linda Coye, and Jeremy Rosen.
"TWO INDIVIDUALS WERE IN THE wrong package, that’s the bottom line," declared Kenneth A. R. Kennedy, professor of ecology and systematics and a forensic anthropologist. He was referring to a case where a funeral home mistakenly mixed up cremated remains.

As a forensic anthropologist, Kennedy is often called upon to identify bones or skeletal material. Kennedy said that the person who identified the human remains in this case was biased by a lawyer who basically "told her what she was going to find." Kennedy also saw the remains and he came up with a different answer. The attorney accepted his report but decided not to use it because it showed evidence damaging to his client. Not using the report was ethical according to Kennedy. "As a forensic anthropologist you’re not out to prove something. It would be unethical if the lawyer predicts the identification and you manipulate data to satisfy him."

Kennedy’s current research involves identifying markers of occupational stress or bone remodelling. For example, "A dancer has unusual stress marks which show the wear and tear on the spinal column. Baseball and football players show interesting marks on the ulna," said Kennedy. Some musicians, like violinists and horn players, have unique stress marks on their clavicles and sternums. He has found and documented 150 markers of occupational stress.

Today, only 47 "certified" forensic anthropologists exist, said Kennedy. Forensic anthropology is the branch of physical anthropology in which anthropological data, criteria and techniques are used to identify individuals from skeletal remains. This may involve issues of civil or criminal law. In 1978, Kennedy became the sixteenth appointed member of the American Academy of Forensic Sciences, which requires members to take a written and practical exam in order to receive certification as a forensic anthropologist.

As a forensic anthropologist, Kennedy is available as a consultant to the medical and legal fields. "You may function as an expert witness in court when you’re certified," he said, "but it’s not illegal to testify if you’re not certified, and it does work."

From left to right, Nancy C. Lovell PhD ’87, Professor Kennedy and John R. Lukacs PhD ’76 excavate the skeleton of a 5000-year-old female at Harappa, Pakistan.
For a forensic anthropologist, making a positive identification means comparing one's list of observations with the description given by the police, medical examiner or lawyer. "Fifty percent of the time you reach a positive identification," said Kennedy.

Identification involves determining the age at death of the remains, time elapsed since death, sex, stature, disease and trauma. Trauma or signs of violence include blows, fractures or knife wounds. "Weapons leave characteristic marks," said Kennedy.

"One of my spookiest cases involved a house on Geneva Street, in Ithaca, New York," he related. "There was a legend that the house was haunted and a grinning face appeared in an upper story window. Several years ago, an electrician who was installing new wiring in the attic opened up a panel and was frightened by a skull." The medical examiner called Kennedy to the scene. He identified it as a mummified skull and said that "It was missing its lower jaw... it could not have been grinning. It was a young male, his dental pathology showed that he was nutritionally stressed and the time elapsed since death was over 50 years. There was not much more I could say. It appeared to be a decapitated head that someone had put up there. They never found the rest of the body."

But he did notice remains of little plants growing out of the skull's base, meaning that at one time the specimen had been buried, then exhumed. "This case was intriguing because of the challenge in establishing the time elapsed since death," said Kennedy.

Kennedy often receives Native American specimens. "These cases are not crime related. Usually we try to find out if the location is a burial site. The job is to estimate time elapsed since death, and race." In one case he identified a skull found in a Native American cemetery as that of a young white female. "My hunch is that it was a white captive," he said.

At Cornell, Kennedy teaches Laboratory and Field Methods in Human Biology, Human Paleontology and Human Evolution. From 1964-1980, he was in the Department of Anthropology, then the Division of Biological Sciences invited him to be a faculty member in the field of ecology and evolutionary biology. "They wanted someone familiar with the biology of the human being," said Kennedy, "but I teach essentially the same courses even though I'm in a different department." Kennedy also belongs to the Department of Asian Studies and remains in the field of anthropology.

He received his BA, MA and PhD from the University of California, Berkeley and in 1978 became a Diplomate of the American Board of Forensic Anthropologists. As a graduate student, his major research interest became human paleontology in South Asia. In 1987 and 1988, he excavated at Harappa, Pakistan, a city of Indus Valley Civilization which goes back about 5,000 years. "I see my main contribution to anthropology to be the study of human evolution in South Asia," said Kennedy.

Back at Cornell, Kennedy keeps himself busy teaching future forensic anthropologists. "Cornell has a very strong human biology program," he said. Several undergraduates and graduate students who have participated in the program have gone on to become forensic anthropologists. The course, Laboratory and Field Methods in Human Biology places an emphasis on forensic anthropology. "I thought it would be fun to organize the teaching of forensic anthropology," said Kennedy. The class consists of graduate and undergraduate students.

"We pitch the course to those with interests in archaeology and medical fields." A few students, like Leni Kaplan '91, plan to pursue careers in forensic sciences.

According to Celisa Mettler '93, "You're not going to find this kind of opportunity outside of medical school." The hands on experience from the laboratories is applicable to the real life career of forensic anthropology.

"It's nice having a course that teaches us to actually do something," said Bill Grae '91. The course, cross-listed in anthropology, is limited to 16 students. "But this semester, 34 showed up the first day," said Kennedy. Students were selected on the basis of their class years and specializations.

"There were many people I had to exclude," he said. "We have a beautiful lab up in Stimson but it doesn't accommodate too many people."

"Forensic anthropology attracts attention because it's snazzy stuff," he said. "People associate it with [the television character] Quincy!" But, Kennedy feels that so few people go into forensic anthropology because "it's a highly specialized study. There's a commitment to knowing a lot of anatomy. In the forensic anthropology business your time is not your own. You may get a phone call to go down to the morgue at any moment. Everyone's always in a rush and it takes several days to do an analysis."

"The positive side is that it's very exciting and you learn a lot from your colleagues," said Kennedy. "We're a happy organization," he smiled, "even if our topics are sometimes macabre."
DIANE IRWIN '94 VISITED CORNELL prior to entering high school. She bought her first Cornell sweatshirt years before she knew she would go to the University. Plus, Irwin has received mail from Cornell since she was in third grade. In fact, she has been involved with Cornell since she was eight years old. The reason: she was in 4-H.

For Irwin and other long-time 4-H members, the introduction to Cornell came years ago as they learned about New York state's land grant institution through their membership in 4-H, an organization dedicated to developing leadership and teaching life skills to youth ages 8 to 19. This early introduction to Cornell is the reason some students enrolled at the University.

"I'm basically here because I was introduced to Cornell when I was on a 4-H trip," explained Irwin. "I fell in love with the scenery and surroundings. Plus, I got to see some of the research going on and learned about my major, agricultural and biological engineering."

Randy Decker '91 echoes Irwin's reason for choosing the University. "I originally wanted to be an [Cornell Cooperative] extension agent and there's no better place to go than to the 'father of it,'" he said.

Some Cornell students, including Irwin, have learned that involvement in 4-H is still possible even though their membership ended at age 19. These students are continuing their 4-H involvement through campus jobs, volunteer work and Collegiate 4-H.

"I didn't want to lose my involvement with 4-H and I wanted something to do at Cornell besides school work," said Eva Marie Nissen '94. When she arrived on campus, after spending eight years as a 4-H member, Nissen volunteered at the state 4-H office in Roberts Hall where her work has since turned into a job. Additionally, Nissen still volunteers with the 4-H in Schenectady County, her home county, and is a member of the Collegiate 4-H on campus.

For students who want to work with 4-H, a variety of volunteer and paid positions exists. Cornell students can apply for jobs around the state at the Cooperative Extension offices in the 57 counties and 5 New York City boroughs.

Volunteer work is available in many aspects of 4-H. Irwin is an assistant project leader for her former club and Tanya Walter '93 presents workshops on public speaking to Tompkins County 4-Hers.

Ilene Kutin '92 started her 4-H involvement when she volunteered to work with an Ithaca 4-H program through her Art of Teaching class. Though the course ended, her work has continued. "I really like working with the kids," Kutin explained. "It's fun and relieves me from all the stress of Cornell."

Another way Cornellians show their commitment to 4-H is by participating in Collegiate 4-H, a volunteer service group, according to Adviser Barbara Eshelman, a recruitment specialist with Cornell Cooperative Extension. "Collegiate 4-H can extend one's involvement with 4-H at the county level, but we are not exclusively for past 4-Hers," she explained. "The group is open to anyone who is interested in learning about community education or wants an opportunity to work with young people."

The club has been a way for alumni to continue their involvement. "I was in 4-H for twelve years. It was such a big part of my life that it was hard to imagine my life without it," said Jan Mennick '93. "When I received a letter telling me about a 4-H meeting on campus, it was so natural to go."

The Cornell Collegiate 4-H has assisted with some Tompkins County Cooperative Extension activities. Members volunteer with the "Ride with E.A.S.E. (Equine Adventure and Self Esteem)" program where they work with handicapped children as they learn how to ride horses.

The Collegiate 4-H members also helped run an "unhaunted house" at the Pyramid Mall in Ithaca last Halloween and the "Animal Extravaganza" this winter. The group also had a booth at the New York State Fair to promote 4-H.

Eshelman hopes the Collegiate 4-Hers can work on campus as ambassadors of Cornell Cooperative Extension. "We're very 'under-marketed,'" she stated. "A lot of students do not understand what Extension is, which is applying education and research to the community."

Commitment to 4-H runs high at Cornell for those who have continued their involvement. Running into other 4-H alumni is a common occurrence which reminds students of their beneficial membership in the organization. Steve Will '92, a member for eight years, noted, "I've run into numerous people on campus... that were very involved in 4-H before... 4-H is ubiquitous on this campus."
NOT TOO LONG AGO, COLLEGE students across the country, including Cornellians, were being chided in the media for their supposed lack of political backbone. But things appear to be taking a turn. Although the level of activism on the Cornell campus has not reached that of the late sixties and early seventies, it has heated up considerably in the last few months. Recent, well-attended rallies and open mikes have addressed issues including the War in the Gulf, the right to display the U.S. flag, the right to burn the U.S. flag, AIDS awareness and divestment of University funds from South Africa.

The heightened interest in political issues has led to more students in the College of Agriculture and Life Sciences sitting up and taking notice of a policy change at Mann Library. On March 1, 1991, the library amended its criteria for allowing Cornell-affiliated groups, political or not, to use seven display cases on the first floor of the building. For the past several years, any group affiliated with the University could petition the library for permission to place a display in the cases. Exhibits ran for a month each and priority was given strictly on a first come, first served basis.

The latest policy places some new restrictions on the use of the display cases. According to Jan Olsen MS '88, PhD '91, Director of Mann Library, the emphasis is simply shifting back to the original purpose of the cases, which was to "showcase the treasures of the library." Citing the February 1991 issue of American Libraries, the publication of the American Library Association, Olsen said that the policy of displaying library materials is consistent with national policy in this field.

Although Mann will now present many of the displays itself, featuring unusual and important materials found in the library, other groups will still be given access to the cases. The new policy, though, stipulates that petitioners must now be connected with the College of Agriculture and Life Sciences or the College of Human Ecology rather than the Cornell community at large. Also, a strong tie-in should exist between the focus of the proposed display and library holdings.

So what do the students think about the change? As expected, opinions on the issue vary. Amy Scanlan '92, an animal science major in the ag college, is against the new policy. "I don't feel the library needs to promote itself," she said.

"The area should remain a public forum," according to Suzy Loisel '92, a biology major. Referring specifically to a rather graphic, controversial display presented by the Cornell Coalition for Life, she added that the cases should be used for "presentation instead of persuasion."

Al Berger '92, who studies agricultural economics, agrees. "The function of the library is to provide information and not opinions."

The timing of the policy change further complicates the issue. Some students believe the change is a direct result of the Cornell Coalition for Life's February display, the last to run under the old policy. Olsen disagrees, pointing out that the decision had been made prior to the display in question and that the exhibit was allowed to run for its full allotted month. She conceded the timing of the change was unfortunate, noting, "The response to the display was more agitated because of the general environment of political unrest on campus."

While Olsen feels the old policy was a good one, she thinks the change was necessary. She said the location of the cases in the library's downstairs lobby presents a unique opportunity to reach not only patrons of Mann, but others who are "just coming through," using the area as a walkway between Warren and Plant Science halls. Olsen added that, in looking back, it "seemed generous to allow Cornell groups to use such a heavily traveled space for exhibits," but now the time has come to raise the public's consciousness of the importance of preserving some of the rarer books in the library. Upcoming displays will feature books on ornithology, botany, lace making and agricultural equipment.

Olsen predicts the new displays will be well received by the public. But how will students react? Will they show their political backbone and oppose this policy change? Are these changes really for the better?
DISAPPEARING BEFORE OUR EYES

INCANDESCENT PARROTS, PINK DOLPHINS and monkeys that can fit on the palm of your hand. All are found in the rain forest, announced the recent Rain Forest Rescue Campaign by the World Wildlife Fund. "Every second another acre of rain forest is destroyed forever," the Fund claims, and with it the parrots, dolphins and monkeys.

Within 30 years, experts on biological diversity predict that we may live in a world containing 25 to 50 percent fewer living species. Even worse, some of these insects, plants, fish, birds, mammals and other groups of species will become extinct before their existence is ever discovered.

"Biological diversity is decreasing at a rate never before experienced in historical time," said Quentin D. Wheeler, professor and chair of the Department of Entomology at Cornell University. "But we are suffering a double loss because not only are we losing species, but also all knowledge that they ever existed."

One of the most dramatic examples of reduced biodiversity occurs among insects. Technological developments have recently enabled entomologists to collect and study insects living in trees 200 feet tall in the Amazon jungle. According to Wheeler, 80 to 90 percent of the species in those collections represent insect species previously unknown to entomologists. Based on those collections, entomologists estimate that the total number of insect species is between 1.5 and 50 million. Only 751,000 species of insects are presently described.

"We do not even know within an order of magnitude how many insect species exist," declared Wheeler. "Due to the alteration of their natural habitats, many of these insects will become extinct before we ever have a chance to discover them."

The problem of disappearing species certainly is not unique to the tropics. For example, Wheeler has found an obscure group of flightless, slime-mold feeding beetles in the Appalachian Mountains. "They are possibly being driven to extinction because there is a growing trend to develop on mountain tops," explained Wheeler.

By calculating the rate of deforestation, entomologists estimate that insect species may disappear at a rate of 160,000 each year for the next 30 years. That is a loss of 456 species per day.

However, insects are not the only group suffering from reduced biodiversity in tropical rain forests and other areas facing destruction. "New species of birds are discovered only because we are destroying their habitats," said Jerrold Davis, assistant professor of botany in the Bailey Hortorum, a unit in the Division of Biological Sciences. "Recently, we have discovered some species of orchids in the tropics only because the trees they live on have been cut down. Who knows how many other undiscovered species remain," he added. Species of fungi, fish, birds, mammals and other groups face similar reductions.

Although most people are not concerned about the extinction of unknown insects and plants, researchers claim that studying and understanding the relationships between all species sheds light on every other aspect of biology. "Unless we have an understanding of the evolutionary and historical patterns of relationships, it becomes difficult to understand almost anything you might want to study in biology," asserted Wheeler. "It would be very difficult to understand the evolution of social behavior, for example, unless you had some sense of what behaviors preceded other ones."

Such historical frameworks among species are generated by the discipline of systematics. "Systematics is really the study of diversity," Wheeler said. "It involves coming up with formal systems of classification so that species can be grouped together based on common ancestral relationships. It also involves figuring out what those relationships are."

Systematics helps researchers make informed decisions about species, explained Wheeler and Davis. Understanding the relationships among species can assist conservationists in choosing techniques best aimed at saving species. It can also help scientists decide which endangered species to devote limited time and money to.

In this "speciescape," the size of individual organisms represents the number of described species in the major taxon. Many species may soon become extinct—some before they are even discovered.

Systematists, whether they specialize in botany, entomology, invertebrate zoology, herpetology, ichthyology, mammalogy or ornithology, find themselves in a race against time. "The rate of deforestation and species extinction seems to be accelerating," said Wheeler. "At the minimum we should sample and preserve as much material as possible so scientists in the future can understand what this diversity was and how species were all related to each other."

This is no easy task. In 1989, fewer than 1,200 graduate students in the United States pursued degrees in systematic biology, compared to over 3,000 in 1979, cited Wheeler. "Even if someone came up to me today and gave me all the funding needed to discover ten million new species of insects, I'm not sure that it would be possible to train and deploy enough people before most of the damage is done, he added.

To complicate the situation further, many systematists discover a lack of desirable teaching and research positions once they graduate with PhDs. "When a systematic retire or leaves his
position for any reason, many institutions close the position or fill it with someone in a related field who is not a systematist," claimed Joseph McHugh '84, a third year PhD candidate in systematic entomology, who is concerned about career opportunities after he receives his degree from Cornell.

Although most people in systematics agree that the field experienced a period of decline, many believe that the future of systematics looks promising. "The image of systematics has begun to improve," explained Davis. "In the past, systematics has been perceived as an old-fashioned form of science which lacked sound theoretical methods. However, over the last 25 years, there has been a resurgence of theoretically sound and reproducible means of discovering evolutionary relationships among species."

Both Davis and Wheeler have found that the importance of systematics is gaining recognition in other scientific fields due to improvements in methodology and technology. "Other biologists find that an understanding of the history of diversification puts their own work into perspective on more sound footing. They are now looking to systematics for information," Davis said.

In light of this renewed interest in systematics and in the importance of understanding biodiversity, Cornell University recently developed the Cornell Institute for Systematics and Biodiversity Studies. One of the goals of this program, located within the Division of Biological Sciences, is to produce graduate students who will become systematics professors and researchers.

"Projections show that there will not be enough systematists to meet the needs of society as biodiversity becomes a major issue within the next ten years," claimed William Crepet, professor and chair of the Bailey Hortorium and a leader in developing the Institute. "We want to produce students who will be well-equipped to fulfill that need."

Another goal of the Institute is to unite systematists who specialize in different fields throughout campus. "We want to bring together people who are interested in systematics from all departments such as the Bailey Hortorium, entomology, ecology and systematics, microbiology, physiology, neurobiology and others," said Crepet. "We are not exclusive. If someone is interested in participating in the Institute, they can."

Cornell, which probably has the strongest systematics community of any university in the country, according to Wheeler and Crepet, also is involved in a joint graduate training program with the American Museum of Natural History in New York City. "This program allows graduate students to work in a major natural history museum with other outstanding systematists for part of their research," explained Wheeler.

Meanwhile, the race to discover new species before they become extinct continues for systematists. 'As dismal as current rates of deforestation are, the rate is likely to increase rather than remain constant," wrote Wheeler in an article appearing in the Annals of the Entomological Society of America. "There is no question that little undisturbed forest will survive into the second quarter of the 21st century. The pressing questions instead are—What will we do? and 'How quickly will we do it?'"

by Cheryl Jacobson '91
Creating Your Own World

by Tim Whitney '91

A WORK OF FICTION WHERE THE sequence of events and eventual outcome are decided not by the author, but by the reader. A computer database so flexible that each user can compile text, graphics and video images into research resources as unique as the users themselves. A classroom environment where the students dictate to a computer the breadth and depth of the knowledge they receive and in turn are motivated by the computer to explore a higher level of learning.

Are these the stuff of science fiction? Or perhaps just glimpses of a seemingly distant future? If so, then the future is being made today with the help of the Interactive Multimedia Group (IMG), located in the recently completed Kennedy Hall. At IMG a small team of researchers, theorists and designers are helping to shape the future of education and entertainment with the aid of the latest computer technology.

In a world where most of what we see, hear and learn is dictated by others, the concept of directing the course of your own entertainment and learning environment may seem foreign.

The concept is simple, yet revolutionary. Rather than the standard media format, where one page of a book follows another or one scene of a film follows another, IMG presents the user with a web of interconnected media events, including text, video and graphics. By allowing users to explore the web and create their own multimedia environment, they establish relationships between the events, relationships which were previously dictated by teachers and textbook authors.

Imagine the scenario. A student is instructed to write a book report about Charles Dickens' classic "A Tale of Two Cities." Instead of having just the novel as a resource, the student is given a multimedia program which allows the exploration not only of the text, but of a vast array of information regarding France in the late 1700s, revolutions in other parts of the world and Dickens himself. The student is able to discuss not only the contents of the novel, but also why it was written and in what social and cultural context.

"Multimedia is really about choices," explained Joan Mazur, a research assistant at IMG and a doctoral candidate in education. "We want to shift the responsibility for learning from the teacher to the learner. We want to provide the students with resources and information so that they may create their own paths through knowledge domains."

This concept of a user-centered technology is reinforced by Dr. Geri Gay MPS '80 and PhD '85, an assistant professor in the Department of Communication and the current director of IMG.

"Interactive multimedia is a convergence of the publishing, computing and video worlds. The computer has made that convergence possible. But until recently, the user has always been passive while the computer did most of the work. We want the users to become, in a sense, the pilot of their computer experience; to interact with the computer and create his or her own multimedia program."

Gay founded the facility in 1987 in response to a need that she felt existed in the linking of computers and education. Since its beginning, IMG has pursued independent research, but has

A screen from the Macintosh version of "The Bughouse," IMG's most extensive application to date.
also maintained important affiliation with both the Department of Communication and Cornell Information Technologies (CIT).

The group currently consists of six full-time staff, including researchers, programmers, designers and educational psychologists. In addition, the group may employ anywhere from four to ten part-time staff members depending on the number of programs being developed. Fortunately for IMG, none of the current state budget cuts will have an effect on their work, as Cornell University provides none of their funding. “Our three biggest contributors are Apple, IBM and the National Science Foundation,” said Gay.

The group’s most impressive work to date is a program called “A Field Guide to Insects and Culture,” developed in conjunction with the Department of Entomology. In the program, users employ touchscreen technology to guide themselves around a house filled with a large array of information about insects and their effects on cultures through the ages. The information is presented in many formats, including slides, video, film and audio, all on the same screen. “The Bughouse,” as it is affectionately called, is currently on display at the Smithsonian National Demonstration Laboratory for Interactive Educational Technologies in Washington, D.C.

Another recent project is currently in use by students enrolled in Spanish Conversation and Composition. The program, entitled “El Avion Hispano,” allows students to piece together a series of incidents onboard a Spanish plane. The students watch on video as the events unfold and after each event they are encouraged to establish relationships between events by looking into the minds of the characters or by requesting the help of an onscreen gypsy, who looks into her crystal ball and gives out important pieces of information about the characters on the plane. Through the use of the program, students explore causal relationships between the events while at the same time learning Spanish in a contextual setting.

IMG is also working intensively with the College of Engineering to create a program on the history of technology which would integrate computer simulations of engineering principles with multimedia technology.

Other projects being pursued include a multimedia based application called “Japanese: The Spoken Language for Scientists and Engineers” which is modeled almost entirely after the FALCON program for learning Japanese. The group is also nearing completion of a program called Discourse Jukebox which explores many different possibilities for interactive multimedia applications.

But despite its relative prominence in the interactive multimedia industry, IMG has managed to maintain a low profile on campus.

“There’s a very good reason for that,” explained Gay. “The facility is small and we don’t have the time or space to become involved in too many projects.” Assistance for those interested in designing multimedia applications can be found in a series of two classes offered during the school year.

“The classes are designed to train people to develop their own interactive multimedia programs,” said Gay. “Many of the people in the classes are from groups who have expressed a desire to incorporate multimedia into their teaching and learning programs.”

But sometimes fame is not easy to avoid. “Apple Corporation announced that Cornell was a place to study interactive multimedia,” said Gay. “So we are getting a little more national coverage than we expected.”

In its early years, however, the group is trying to establish itself before gaining publicity. “Just maintaining the group we have now is a big enough task,” said Gay.

But the future looks bright for Cornell’s IMG program. “We’re trying to stay out of the multimedia mainstream,” said Gay. “We want to find the leading edge of design technology. There is a big push now to work with the College of Engineering so it can focus on the technological aspects of multimedia while the group focuses on issues of design, theory, research and teaching.

“There’s a lot of theory involved in designing interactive multimedia applications. We know that as a means for delivering and communicating messages, the technology is very exciting. But, to tell you the truth, we really have no idea how far we can take the technology.”

But if their accomplishments in the near future are much like those in the recent past, the Interactive Multimedia Group could help to usher in the new millennium by opening the door to a world where the environment does not shape the individual, but the individual shapes the environment.
Not-so-degradable Plastics

CONSUMERS BUYING PLASTIC PRODUCTS because they are labeled biodegradable may want to think twice. Once hailed as a remedy for over-stuffed landfills, most biodegradable plastics do not actually break down into their natural elements as manufacturers advertise. Researchers in the Department of Agricultural and Biological Engineering recently discovered that the plastic materials in products packaged as biodegradable—including some types of egg cartons, trash bags, disposable diapers and six-pack beverage rings—do not really biodegrade.

The $100 billion plastic industry generates 15 percent of the material found in U.S. landfills. Non-degradable plastics not only take up space but release toxic gases when burned. These problems created the need for a plastic that would break down naturally into harmless elements.

The new plastic products, marketed as biodegradable, were tested in two-foot-tall bioreactors “similar to the acid vats in the Batman film,” said William Jewell, a professor of agricultural and biological engineering in the College of Agriculture and Life Sciences. The bioreactors contained starved bacteria eager to consume any biodegradable material that was thrown in the reactors. “We can take a McDonald’s cup, put the whole thing into the reactor, and see what happens to it,” Jewell said.

If the styrofoam cup is biodegradable, according to the scientific definition, the bacteria will break the cup down into carbon dioxide and water in aerobic conditions, with oxygen present, or carbon dioxide and methane in anaerobic conditions, without oxygen present. Materials were tested under the two conditions to simulate the environments of both compost and landfill.

In a bioreactor, a biodegradable substance can decompose within days, but in a landfill or compost it may take several years. Before the bioreactor, researchers had to wait years for a substance to degrade in order to measure its byproducts. Because of this, past studies could not determine whether the plastics were actually degrading into gases or merely breaking down into tiny pieces, Jewell said.

Part of the problem lies in defining the term “biodegradable”. Disregarding the scientific definition, plastic manufacturers say a substance is biodegradable if it breaks up into tiny pieces, which creates more space in a landfill. “They may be trying to squeeze in underneath the definition,” Jewell said. “If something is ten percent biodegradable, should we still consider it biodegradable?”

In an attempt to “squeeze underneath,” manufacturers added starch—a biodegradable substance—to normal plastic, hopeful that the starch and plastic would degrade together. The assumption was that the starch would break the long chains of plastic molecules, thereby promoting degradation. “We, in fact, thought that would indeed be the case,” Jewell said.

But when this type of plastic was tested in the bioreactor, only the starch biodegraded or decomposed into gas. Although the plastic was broken into many pieces, its mass remained the same, Jewell said.

Some manufacturers developed these so-called biodegradable plastics because many states had banned the use of plastics in some products. But the manufacturers’ real motivation was to target the environmentally conscious consumer, said Ellen Harrison, the associate director of the Cornell Waste Management Institute. Many consumers may be more inclined to buy a product marked biodegradable. “People think that if it’s labeled biodegradable, it’s O.K. to throw away. That’s simply not true,” Harrison said.

Perhaps it is not true in the United States, but European manufacturers have developed a plastic that is 100 percent biodegradable, Jewell said. Unlike normal plastics made from crude oil, this new plastic is composed from milk or bacterial by-products. However, one setback may hamper its success in U.S. markets. “The cost of most plastics is one-tenth the cost of the European bacterial plastic,” Jewell said. “The cost would have to come down a great deal before any of these products can be widely used.”

In the future, efforts may shift away from producing more degradable plastics towards improving the method of recycling plastics. “Making a biodegradable plastic is in many cases not desirable,” Jewell said. “We ought to demand recycling systems which are much more efficient than landfills.” With the current setbacks of so-called biodegradable plastics, manufacturers may soon try to win over consumers with a plastic marked ‘recyclable’.

by Deborah Steuer ’91
**Seen Any Tagged Crows?**

**IF YOU LIVE IN OR AROUND THE Ithaca, New York area, you may have noticed crows decorated with black and white wing tags. Students like Tim Whitney ’91 have spotted some. He saw some tagged crows near his fraternity house on Thurston Avenue. “We used to notice some crows near the house,” he said, “but recently we began to notice the tags on their wings.” In the summer of 1990, approximately 45 American crows and three fish crows were marked with wing tags and colored leg bands. These markings are a part of one man’s research. Dr. Kevin McGowan, research associate, Section of Ecology and Systematics in the Division of Biological Sciences, hopes to learn more about the crow’s social systems and to gather basic information about the crow. His research began with the hunt for local nesting sites. With the help of information gained from flyers and personal searches, McGowan started placing colored bands on the legs of crow nestlings. One drawback to the leg bands was that when the crows walked in the grass, he was unable to see the bands. Another problem occurred when the crows sometimes removed the plastic bands with their beaks. “Last year I began using wing tags along with the leg bands,” McGowan noted. “Each tag is marked with two letters; this allows for easier identification.” McGowan places one identification tag on each wing of crow nestlings when they are about 25 days old. McGowan said that the tags do not harm the crows. These tags allow McGowan to keep track of the birds as they grow up and leave the nest. He would like to be able to tag free-flying adults, but because crows are a hunted species and are very smart, crows remain extremely wary. But, once people know that the birds are out there, it becomes easier to notice them. Tagged crows are known to frequent many areas of the campus. McGowan encourages students to contact him upon sighting tagged birds, in order to continue monitoring their whereabouts. While many people think of the crow as an “agricultural pest”, this is not usually the case. While the potential for a localized problem from a flock attack on a farm or garden exists, total amounts of actual produce lost to crows is minor. Crows are more of a threat to earthworms and beetle larvae than to corn crops. According to McGowan, the crow has not been studied as thoroughly as many other birds. He hopes to answer some questions concerning the crow through his tagging and monitoring procedure. He hopes to determine whether or not crows hold a territory, where they end up in relation to where they are tagged and how well they survive. Of the 45 crows that were tagged in 1990, McGowan has still seen over 20 crows throughout the winter of 1990-1991. “This shows the variability of the crow,” He noted. “Some populations have been known to be migratory in the winter.” Another interesting characteristic that the crow exhibits, which has been a focus of McGowan’s work, is that in some instances four or five “helpers” outside the parents aid in the raising of nestlings. This appears to be a paradox to the theories of modern evolution which would rather see each bird trying to pass on its genes to the next generation. The helper aids the parents to pass genes, not its own. Only about 300 species of birds out of 9,000 have this trait. McGowan hopes to be able to determine which crows become helpers and why. The odds of people in the Ithaca area observing a tagged crow will rise in the future, as tagging will continue over the next few years. Questions relating to crow demographics and nest success should be answered shortly. Figures concerning partial brood losses suffered by the crows are already coming in. Information on losses accountable to other factors besides predators may become very important. Although test results are not in yet, McGowan showed some concerns about the use of pesticides on the lawns in the Cayuga Heights area and egg hatchability. Through McGowan’s research, the crow’s social systems and demographics should become clear over the next few years. ■

*by Shawn Vargo ’91*

**This crow nestling has just been fitted with wing tips and colored leg bands.**

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**RAW_TEXT**

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*by Shawn Vargo ’91*

**This crow nestling has just been fitted with wing tips and colored leg bands.**
Chivalry is Alive and Well

by Benjy Kile '92

ON MOST DAYS, VISITORS TO THE Cornell University campus drive past Risley Residential College for the Creative and Performing Arts, also known as Risley Hall, and admire its Tudor architecture. But, on Sunday afternoons, they often park along the road to stay awhile and watch as a piece of history is reenacted before their eyes.

As the front doors of the building open, fighters emerge from its castle-like tower. Warriors meet on the front lawn grass to practice battling in the medieval tradition. Clad in leather and armor, they recreate battles that took place centuries ago.

Many of those who venture past Risley on Sundays find themselves looking twice before they realize what they are seeing. Who are these people fighting each other in layers of heavy metal? They are the Society for Creative Anachronism (SCA), a group of over thirty students, faculty and Ithaca residents who preserve history by recreating it.

In 1966, the SCA was formed in Berkeley, California and its popularity spread quickly. Today, members of this international society can be found across the United States as well as in Canada, Australia, New Zealand, Japan and parts of Europe.

The Ithaca society was formed in 1974 and found its home at Risley Hall. The society resembles other organizations such as lodges or other national clubs which one might find spread throughout the country. They are a group of individuals with a common interest, holding weekly meetings and social events. However, unlike the ELKS or Lions Clubs, the SCA has its differences. It can be compared to organizations that focus on other periods of history, such as the Civil War.

"It is a social club," explains Marianne Hansen, an Ithaca, New York, resident and member of the Society, "but, it is also the only national forum in which you can get support for medieval re-creation."

History is recreated whenever the SCA meets. Each spring and fall at Risley, society members hold what they call "events." Fighting tournaments, feasts and dancing in the spirit of the Middle Ages are the primary activities. Members of the society dress in authentic costumes, most of which they have made themselves. The tournament features battles between society members. Warriors are matched against each other. They also prepare meals based on medieval recipes. Risley is the perfect place for recreating a medieval environment. With its red brick structure and elaborate dining hall (a replica of Christ Church at Oxford University), Risley enhances the atmosphere that the SCA tries to create.

The dancing is also from the medieval period. One example is the "pavane," a processional dance with a simple step. This dance was used to present one's elaborate costume in the Middle Ages. Another example is the "bransle" which is more lively dance used in celebration.

A summer event is also held at Camp Barton near Ithaca. Other tournaments and meetings take place across the country, often involving medieval armies of over 1000 warriors. One such tournament, the Pensic War, takes place every year in Slippery Rock, Pennsylvania, and the Nineteenth War last year was attended by over 6000 people.

The Society for Creative Anachronism also serves as an extracurricular activity for more than two dozen students. Some enter the group to learn about history, by reading, talking to others and participating in the Society's events. Others enjoy the atmosphere and friendship of the group.

"SCA gives me an opportunity to learn about the medieval period in
more detail than I could in history, literature or art history courses," said Janis Kohler '91, a student in the ag college, "We try to recreate aspects of art and culture from original sources and archeological records whenever possible."

Some of the more adventurous members of the Society may find themselves trying to make their own armor. Robert MacPherson '81, an Ithaca resident and member of the Society since 1978, has become skilled in building armor from various time periods. MacPherson can be found working in the Risley metal shop, creating a helmet, breastplate or weapon to be used in the Sunday fighting practices. He starts with sketches or pictures from books about the Middle Ages. He then draws his own plans for the suits of armor to be built. Using steel and leather and a lot of trial and error adjustment, MacPherson creates each piece of the suit to fit the body that will wear the armor.

"A basic suit of armor may take as many as 300 hours to build," MacPherson said, "More detailed suits may take much longer."

The fighting practice is held every Sunday afternoon and those who want to sharpen their skills in authentic battling styles meet to oppose one another. The blows that they inflict upon each other are real. Each member is protected by the armor or sporting equipment that he or she may be wearing. A warrior who is hit by a blow felt to be adequate as a "kill" falls to the ground accepting defeat. The primary weapons used for battling are swords, great swords and glaives, which are long poles with simulated ax-heads. All of the weapons are made from rattan, a thick, strong vine typically used to make furniture.

Most students who are interested in the Society do not find themselves building their own suits of armor, however. In the beginning, newcomers to the group are expected to watch and learn. That is what draws many of them to the organization. The interest in the Middle Ages is the theme that brings students to the SCA. They learn by listening to older members in the group and work their way up to actually participating in the activities.

As new members grow and learn, they can become more integral members of the society. Those interested in becoming officially enrolled in the national organization pay a $20 membership fee each year. Those in the national organization can take one of the many offices within their local group.

The Ithaca society meets twice each week at Risley. One meeting centers on matters of business and arts where members dance or hear presentations. The other meeting is the fighting practice on the front lawn of Risley.

The students who enter the society often learn more about medieval history than they ever expected. Learning by actually recreating history, instead of merely reading it, is an alternative way to gaining knowledge about the medieval period. They also enjoy the company of those who are drawn to the group for the same reason.

"I've always been interested in the Middle Ages," said Kohler, "It is nice to get together with people that share your interests but have a different perspective."

Every Sunday one can find the Society for Creative Anachronism at Risley Hall. When the sun begins to set, the warriors remove their suits of armor and return to the castle, tired from an afternoon of battle. But, they will return on the following Sunday, fresh and ready to not only fight one another, but to preserve a piece of history.
Plant Hunting Adventures

by Brian Schilling '91

WHILE THE LIFE OF AN ACADEMICIAN is generally regarded as full of intellectual excitement, it is eminently safe in a physical sense. Rarely does the quest for knowledge or the drive to publish demand that the scholar dodge bullets or tidal waves. But there are exceptions. Liberty Hyde Bailey, in fact, endured both during his long and colorful association with Cornell University as scientist, as author, as visionary architect of the College of Agriculture and as perhaps its greatest teacher. In each role, he was anything but typical.

The mystery behind how Bailey accomplished so much and assumed so many roles is best explained by Bailey himself. When he took his early retirement as the Director of the College of Agriculture at age 55, he explained that as a young man about to enter college, he had drawn up a life-plan to spend 25 years of his life in training, 25 years in service making a living, and another 25 years doing what he most wanted to do. Bailey complicated his own plan by living far beyond the allotted 75 years to the age of 94.

The first stage of his life started out magnificently. After graduating from the Michigan State Agriculture College, Bailey went to work at Harvard University for the world’s pre-eminent botanist, Asa Gray. Gray had placed an ad for an assistant willing to “work long hours for little pay primarily for the love of the work.” Bailey rose to the challenge. During his association with Gray, Bailey distinguished himself by preparing an exhaustive account of the genus Carex, the best one to date.

Disregarding Gray’s protests, however, Bailey soon accepted a position at his alma mater as professor of horticulture and landscape gardening. Gray held horticulture in the lowest esteem, and he knew also that Bailey had almost no training in the area. Skeptically, Gray asked, “What do you know about horticulture?” Despite the cool response from Gray, Bailey went back to Michigan and soon began to distinguish himself in both teaching and research.

It was not long before word of the young Michigan professor spread to New York—to Cornell. Moreover, in 1887, the Hatch Act had just been passed in New York state, giving Cornell $15,000 a year for agricultural experimentation. With money to spend, the President of Cornell University, Charles Kendall Adams, paid a visit to Bailey and extended him an offer to become the first professor of horticulture at Cornell, and in the United States.

It was an offer Bailey could not refuse. Adams offered him a salary substantially higher than he could expect from Michigan—almost $3,000 a year! But more important, Adams offered Bailey a chance to build the horticulture department of his dreams. As the first professor in the department, he would have full control over its growth and development. Also on the list of enticements, a $150 microscope.

Bailey’s arrival on campus was significant enough to warrant a blurb in the New York Times announcing the event with the comment that Bailey would, “no doubt have a significant impact on the agriculture of the state.” He did not disappoint.

As a teacher, Bailey was impressive.
Bailey had always believed that the best learning took place outside the classroom, and he demonstrated this by frequently taking his students on excursions to the surrounding farms and orchards, often getting dirty right alongside the students. In the classroom, Bailey forced students to examine accepted ideas and taught that critical thinking was essential to any study. Forever running out of time in the classroom, Bailey would enter the room talking, stop briefly for questions or to let students catch up on their notes and finally end, still talking, by using the door as a period to cut himself off.

But in 1903, Bailey had to give up teaching when he was pressed into service as the new Director of the College of Agriculture. At that time, the agriculture college was still a department of the arts school, with no state funding and no real autonomy. Bailey saw room for improvement.

Across the nation, many agricultural colleges were receiving all or most of their funding from their state governments. Bailey wanted to see that trend at Cornell, even if it meant giving up some autonomy over the agricultural college's affairs. The trustees and faculty objected, but Bailey championed the cause. Establishing the New York State College of Agriculture was to be Bailey's greatest battle.

While opposition in Ithaca was quickly convinced of the need for more funding, opposition elsewhere flourished. Chancellor James R. Day of Syracuse University argued that state funds be distributed evenly to all colleges in the state with agriculture programs. Legislators balked at the $250,000 Bailey requested for the construction of a new building. Even supporters questioned whether the amount was too much for one building.

But Bailey took his cause to the state's farmers, and then to Albany. He was a one-man lobbying effort, marshaling support behind his bill. The opposition, however, did not sit still. As the bill drew near a vote, Chancellor Day began vigorously agitating for an equal distribution of state funds.

On May 9, 1904, due almost entirely to Bailey's efforts, the bill passed. The New York State College of Agriculture at Cornell was born. Pleased at his victory, and confident that Day's outcry had antagonized enough neutral legislators to give him the victory, Bailey hung a picture of Day on his wall with the mocking note, "The founder of the New York State College of Agriculture at Cornell" beneath.

Over the protest and at the surprise of the trustees of the University, Bailey "retired" from his position as director in 1913. The third stage of his life was at hand, and it was time to move on.

Following a farewell party, Bailey assumed the position of director of the Hortorium (now housed on the fourth floor of Mann Library) and almost immediately set out to expand on his collection. Bailey's penchant for taking inquiry out of the lab and far away across the globe probably sprang from his childhood during which Albert R. Mann wrote '04, "It was his constant desire to know the world in which he lived, to explore the caves and holes and trees where the birds and animals lived." Bailey's travels ranged far beyond the woods of his native Michigan. He ventured to Trinidad, Mexico, Brazil, the West Indies, the west coast, the east coast, Europe, China and the Caribbean to name only a few.

Stories abound of his scrapes with death and danger. On one of his many trips to the Caribbean, he found himself on the side of an exposed cliff when he heard a native shout that a tidal wave was approaching. Trapped, Bailey resigned himself to his fate, but somehow weathered the wave, minus all his equipment and the specimens he had collected that day. Still, he went on to penetrate the dense jungle by taking to the trees and travelling in Tarzan fashion from branch to branch to come up with a rare species of palm. He later commented simply that, "I got what I was after."

On another occasion, the trustees were alarmed to hear that the 79-year-old Bailey was trapped in an 18-foot open skiff on high seas without food or water. But again, Bailey emerged unscathed. In another sea-going adventure, a crew member drew a gun on the ship's captain. Bailey, then in his 80s, disarmed the mutinous crew member and helped throw him overboard.

For a man who spent so much of his life classifying things, it is ironic that Bailey himself is so hard to classify. He was at once a great teacher, a great administrator and a great scholar. In the words of Cornell historian Morris Bishop, Bailey remains "an example of productive energy that no one else has had the strength and genius to follow."
Seeing The Ag College in A Different Light

I ALMOST WENT TO THE UNIVERSITY of Pennsylvania. As a high school senior, I was disgruntled enough by the fact that Cornell was in Ithaca, N.Y., but the College of Agriculture and Life Sciences? My skepticism increased when I received my "We Grow the Ivy" button from the College. It did not seem like a "Black Thing." Other students of African descent had similar misgivings concerning the ag college, but many have been pleasantly surprised after arriving at Cornell.

"The ag college has a lot of opportunities," said Angela Gaddis '93, a business management major. She added that students of African descent should examine the College's curriculum more closely to note the range of programs of study. Rey Hollingsworth '92 commented that the College has majors such as communication and business which are of particular importance. "Black people need to control their own media and... get more involved in business education in order to establish economic independence in their communities," he said.

Andy Martin '92 pointed out that in the ag college, "We are encouraged to put our education to practical use." Martin transferred from the College of Engineering to the ag college. He found the agricultural engineering program better suited to his academic needs. In addition, he pointed out that the SUNY status of the College made economic sense for students of African descent. "Many of us are at an economic disadvantage and cannot afford the private colleges' costs," he stated.

John Steve Halaby '92, a student in the College of Arts and Sciences, regrets not transferring to the ag college simply because "It's cheaper." Tuition and fees for New York state residents are $5,994—about half the cost of one of the private colleges.

But with these and other benefits, why aren't more students of African descent attracted to the College of Agriculture and Life Sciences? Out of 3,041 undergraduate students in the College, only 87 are of African descent, according to fall 1990 registration figures.

Catherine M. Thompson, associate coordinator of Student Services added that the enrollment of students of African descent has remained relatively stable over the past few years.

However, many agree that the name of the College itself is a hindrance. "There is a stigma attached to agricultural fields and programs, and many of us, especially those from urban areas, believe that we will be confined to rural studies," commented Martin. Another concern is a perceived lack of support mechanisms for students of African descent in the College.

Thompson pointed out that there is an organization called "Minority Students in ag" that students are welcome to join and implement programs in. She added that COSEP (Committee on Special Education Projects) attempts to help students of color "financially, socially and academically." COSEP offers scholarships, tutorial systems, social activities, and student advisors to students of color.

Eulas Boyd '93, a communication major, pointed out that "There is not enough information put out in our communities about the ag college."

These students agree that the College should seek out students of African descent more aggressively. Hollingsworth stated that "The College must commit to the recruitment, retention and successful graduation of our students."

Don Fleming '92 believes that the number of faculty and staff members of African descent must increase. These students try to network and encourage applicants of African descent to consider the College.

Thompson added that she would definitely like to see more students of African descent in the College, and added that "Black students are doing a lot university-wide, but I would like to see more college-based activities."

The ag college may be an excellent academic and economic alternative for students of African descent. Students agree that there are many aspects of the College that high school students are unaware of, and aggressive programming may increase the number of students of African descent at the College, therefore adding to the College's population diversity. This can only benefit the students, the College and the University. ■
Construction Begins on American Indian House

March 1, 1991, marked the beginning of the construction of Akwe:kon, the new American Indian residence program house. A traditional Iroquois tobacco-burning ceremony honored the event. The residence program building will house 35 students plus faculty-in-residence and visiting scholars. Located at the corner of Triphammer and Jessup roads, the center will open in fall 1991 semester.

In addition to residence facilities, Akwe:kon will have a library as well as computers and office space for the American Indian Program. The intercollegiate program, with approximately 20 affiliated faculty members, offers courses to increase students’ awareness of American Indian heritage.

Akwe:kon in the Mohawk language means “all of us.” “This house, built on historical Cayuga homelands, will be a supportive community for Native and non-Native students who are interested in American Indian issues,” said Ron LaFrance, director of the American Indian Program.

Emeritus Professor Honored by Wine and Grape Foundation

Dr. E. Fred Taschenberg PhD ’45, professor emeritus of entomology at Cornell’s New York State Agricultural Experiment Station at Geneva, was recently honored by the New York State Wine and Grape Foundation for his extraordinary contributions in viticultural research for the New York wine and grape industry.

Taschenberg’s research efforts focused on controlling minor and major grape pests. He carefully extracted the many new insecticides that became available after World War II. His treatment programs were followed strictly by New York grape growers and his recommendations avoided excessive pesticide residue on the grapes and in the juice.

When presenting the award to Taschenberg, Jim Finkle of the Canandaigua Wine Company said, “What made Fred Taschenberg so special to the growers was his availability. Whenever anyone had an insect problem, whether it was something he was working on or not, Tasch was there to help.”

Plant Pathologist Promoted to Professor

Dr. Harvey Hoch has been promoted to full professor in the department of plant pathology at Cornell’s New York State Agricultural Experiment Station at Geneva. Hoch is in charge of the research program in cell biology in the department and oversees the station’s two electron microscopes.

Hoch’s early research was concerned with biological control of plant diseases. In recent years, he has developed an internationally recognized program that explains the processes by which parasitic fungi develop the structures needed to infect plants. Hoch is currently studying ways to control infections by interfering with fungal structures.

Science Association Honors Three Faculty Members

Three faculty members—William D. Pardee, professor in the Department of Plant Breeding and Biometry; Ravindra N. Sudan, the IBM Professor of Engineering; and Paul F. Vellman, associate professor in the School of Industrial and Labor Relations—were among 280 scholars named as fellows of the American Association for the Advancement of Science. A fellow is described by the association as “a member whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished.”

New Apple Named by Cornell Scientists

Royal Empire is the name of a new apple variety recently introduced by Teeple Farms, Wolcott, New York, and Cornell’s New York State Agricultural Experiment Station at Geneva. The new apple is a variety of Empire, which was named by the station in 1966 and has become one of the most popular varieties grown in the northeastern United States. Similar in taste and texture to the Empire, Royal Empire exhibits a richer color that will enable a greater proportion of the apples to qualify for the extra fancy grade that sells for a higher price in the stores.

Food Scientist Receives Two Awards

Robert Kime, a researcher in the Department of Food Science and Technology at Cornell’s New York State Agricultural Experiment Station at Geneva, was presented with the 1990 Beekeeper of the Year Award by the Empire State Honey Producers Association. Kime also recently won the E.A. Weiss Award for Best of Show in the Eastern Apicultural Society’s mead (honey wine) competition.

Kime’s research on honey has resulted in two U.S. patents, two patents pending and more than 10 publications. Kime’s discoveries involve the use of honey as an antioxidant and clarifying agent in fruit juices and wines and a new method of making mead. He frequently lectures on bees, beekeeping and honey at local schools, civic organizations and national honey producers associations.
HAVE YOU EVER OWNED A PET? Maybe a cat or dog? Remember the hassle of taking care of it—feeding and cleaning up after it day after day? Well, imagine caring for a steer weighing 972 pounds and still growing. The members of the Block and Bridle Club are accustomed to it.

What is it like working with such large animals? According to Beth Wood '91, the club's president the last two years, "It can be a little intimidating for some people. But that's what makes it fun. It's a real challenge."

The Block and Bridle Club claims to be the oldest student organization on campus. Professor Henry H. Wing, 1881 of the animal husbandry department established the club in March 1907 under the name of the Round-Up Club. Wing decided to form the club after entertaining some students at his house one weekend. During the 1940s, the club decided to associate itself with the national Block and Bridle Club. Not until last year did the Cornell group officially change their name to match the national organization's name.

The organization is a livestock club open to any student who wants to gain experience in all phases of meat production—from feeding the animals to washing and deboning the meat after the animal is slaughtered. "The club allows students to gain in-depth knowledge in working with livestock, and it gives them an opportunity to be exposed to all different areas of agricultural work," said Bill Green, an advisor.

Green has been involved with the national Block and Bridle Club since his college days at Montana State University, and has served as the Cornell club's faculty advisor for the past five years. The students, though, bear most of the club's responsibility. "I just try to encourage activities that I feel are educational as well as entertaining," he said.

The club's activities cover a wide range. In August, members take animals to the New York State Fair to be judged for prizes. Then there is the bull test in late fall. Northeast beef producers bring their bulls to Cornell for the club to raise them as a group under the same environmental conditions. A select few are then picked, based on performance and other important traits, to be sold at the annual bull sale. The week before the sale, club members will wash and clip these bulls. This can be an interesting experience. "The old members help out the new ones to make sure they know where not to get their fingers caught. You have to keep on your toes, because each animal reacts differently," said Wood.

The largest task of the club is the preparation of the animal project for the Student Livestock Show held every April on campus. Mark Thomas '93, the project chairman, has to go out and find someone to donate a steer and some pigs. "It's not easy since that type of donation is a large economic investment. But there are producers in New York that are happy to contribute for educational purposes," he said.

This year the steer, named Hippy-Chick, was donated by Sunrise Farms of Auburn, New York, and the two hogs were donated by Misty Meadow Farm of Romulus, New York, and Hog Haven of Cortland, New York.

Club members feed the animals twice a day and weigh them monthly to see if they are growing at the projected weight. "Right now Hippy-Chick is growing 3.85 pounds a day, so he should have no problem reaching 1,100 pounds by the sale date of April 20, at the Student Livestock Show. Right now the pigs weigh around 115 pounds, and we want them to get up to 215 pounds," said Thomas.

At the show, the animals are auctioned off and then slaughtered and processed by the students. The proceeds from the sales are split between the Student Livestock Show, the Willman 4-H Fund and the Block and Bridle Club.

In addition, the club holds many other functions, including picnics in the fall and spring, a winter banquet, spaghetti dinners and square dances. It is open to any student wishing to join.

"The thing that makes this group so special is their enthusiasm. They are a very active group," said Green.

Thomas agrees. "The nice thing about the club is that because of its smaller size, everyone knows everybody, and most of us are good friends. Most of our time away from the club we spend together anyway."

This camaraderie shines through when the 23-person club works together all year caring for the livestock, and one another.
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Cornell's Glass Menagerie p. 6

Beyond the Ag Quad
About the Issue

Beyond the Ag Quad focuses on researchers and students, within the College of Agriculture and Life Sciences, whose efforts have been far reaching. The Countryman also looks at present-day and future developments that will continue to affect the world for many years.

On the Cover:

Cover design by Tim Whitney

What’s in a name? The Countryman staff has been struggling with that question. Is our name sexist or generic, a time-honored tradition or a stubborn throwback? The point here is that we want your opinion! Should the name of this magazine change? The editorial staff urges our readers to send us their comments and suggestions.

Correction:

In our December, 1990 article, “Killer Fungus From Japan,” we incorrectly stated that the agent being studied to find a defense against gypsy moth caterpillars is a virus. Not so—it’s a fungus. Researchers place soil containing the fungus around trees in the caterpillar-infested areas, those caterpillars that encounter the fungus become infected.

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REACH OUT AND TOUCH A BOOK

by Olugbemisola Amusa-Shonubi '91

"IF A KID CAN'T READ A STREET SIGN, his or her aspirations about becoming CEO of a major company or President of the United States will obviously be shot down," mused Danielle Rembert '94. "By becoming involved in a literacy program, I will be helping my people and giving back to my community."

To help combat the problem of illiteracy, Rembert participated in the Harlem Literacy Project during the summer of 1991. The project, which began in 1990, is sponsored by the Cornell Cooperative Extension in New York City.

The idea behind the Harlem Literacy Project was sparked by a telephone conversation between Cornell Professor of English Scott McMillin and Cornell Trustee Joseph Holland '78. Holland had been pushing to get approval for programs where Cornell students would become involved in urban areas. Both men believed that work in literacy was necessary, so after further discussion, they decided to try and reach young children by reading to and with them. "We wanted to have an early impact . . . let something natural take hold," said McMillin.

Ideas in hand, McMillin began to look for a group of students who would take on this project. The Inner City Lab program in Ujamaa Residential College fit the bill. Students involved in this program usually did volunteer work, but the four students involved in the first Harlem Literacy Project during the summer of 1990 were salaried in part by the President's Fund for Educational Initiatives and the Public Service Network.

The summer of 1990 was an exhilarating and frustrating one for the four pioneer teachers. "It was hard to see children who didn't have many of the things that we take for granted . . . and at the same time were so full of aspirations, goals, and the eagerness to learn," commented Juan Pena '92, a student in the College of Human Ecology.

Pena and the three other students involved in the 1990 project began their training by becoming acquainted with Cornell Cooperative Extension and its Expanded Food and Nutrition Program. During this training period, they also collected books to use over the summer. "We really wanted books that Black and Latino children could relate to," said Pena.

The Cornell students built a library of books that reflected the cultures of the youth they met.

Then the actual teaching began. Their basic duties were carried out in group and individual settings. "I was a little worried about the home visits at first," admitted Tracy Warner '92, a student in the College of Architecture, Art, and Planning. Warner and the others felt that families would not be receptive to book-toting strangers.

They were in for a pleasant surprise. "Everyone was so warm . . . I really felt close to the family I worked with," said Pena. "They even wanted to pay me to keep coming once the job was officially over."

The students also worked with groups of children at community centers, schools, and transitional homes. Sometimes they had to improvise by making up their own stories or by having the children write their own. "It was a challenge," said Pena.

None of the Cornell students came across the stereotypical angry, lazy, uncouth inner-city youth seen in movies or on television. "These kids were motivated and very bright," added Pena. "You could see that they were just not getting the attention they deserved from their teachers."

The Cornell students also worked with some high school students and adults. "Even though we didn't always deal specifically with nutrition or even literacy, we did the most important thing," explained Warner. "We reached out to people and they reached out to us."

The program is now in operation throughout the year. After it received a $175,000 foundation grant, it was possible to train Cornell Cooperative Extension employees and Harlem residents to continue with the work in literacy and nutrition. "It has turned into a full-time operation," said McMillin.

McMillin also hopes to continue expansion of the project by adding more Inner City Lab participants and also developing a similar program in the South Bronx. "I would like to see Cornell make a major commitment to cooperative extension activities in inner cities in New York state," he added.

"Education is the key to success in everything," pointed out Rembert. "I wouldn't be at Cornell if a lot of people before me hadn't given back to their communities. We have to keep up the tradition."
The Women of the Countryman

IN 1872 A YOUTHFUL CORNELL UNIVERSITY sent shock waves through the most prestigious echelons of higher education by formally opening its doors to women. Once in the doors, however, early female Cornellians had no guarantee of participation in activities outside of classes—except those earmarked for women only. Coeducation was one thing, coeducational activities quite another.

Happily, a few exceptions did exist and the Cornell Countryman was one of them. Women have been members of the Countryman's staff from the time it began as an extracurricular activity in 1903 to today as a course in the Department of Communication in the College of Agriculture and Life Sciences.

The Countryman began publication with Mary C. Shepperson '04, '08 as its first female staff member, followed in the next few years by Florence M. Cook '05, '07, Louise P. Hastings '06 and Phlvena B. Fletcher '07.

These women produced a Countryman quite different from today's magazine. This smaller, thicker version was staffed by students who were either elected or appointed to positions, depending on the year. Most of the articles were written by faculty and professionals in the field of agriculture. The Countryman staff solicited and edited these articles and sold advertising space to local and national businesses, which was a major source of revenue for the magazine.

The Countryman's early inclusion of women was unfortunately followed by a five-year period during which the magazine had an all-male staff. But Katherine H. Mills '14 broke that trend in 1914, when she assumed the newly created position of women's editor.

The women's editors were primarily responsible for making the Countryman appeal to its female readership by including articles of a domestic nature, many of which focused on cooking techniques.

For example, during the two world wars and the Great Depression, the women's editors included articles that focused on ways to spend food money wisely and make the best use of ration coupons. The position of women's editor survived through the 1960s, varying in name from women's editor to home economics editor to Domecon Doings editor, and in some years not existing at all.

Almost all of the Countryman women were students in the College of Agriculture, and many majored in home economics, a department of the ag college until its 1925 elevation to a college. Recognizing the importance of home economics, the Countryman gave it a voice in 1917 by adding a column, "The Farm Home," targeted specifically at the female readership. Gladys Marion Hess '17, the women's editor that year, introduced the first "Farm Home" column in the June 1917 issue. It was to address "all that goes to make up a good home—good food, good music, good pictures, the best books . . . good health; [and] labor-saving machinery . . . ."

Although this new column gave women more status in the Countryman, no more than two women (as co-women's editors) were ever on the staff at the same time until 1920. During that year Elizabeth T. Cooper '21 and two other women were elected to the editorial staff. The following year, Cooper became the women's editor. For many of the subsequent female staff, this was a typical pattern: one year as editorial staff followed by one year as women's editor.

In 1924 the staff positions available to women expanded with the election of Florence H. Hershey '25 and Catherine A. Doyle '26 to the business staff. Both women represented "firsts" in other ways, too. Hershey, from Florin, Pennsylvania, was the Countryman's first female out-of-stater, and Doyle became the first fe-
The 1930 Countryman was one of many activities in which Erma R. Lewis '30, Beatrice E. Foster '30 and Jean O. Frederick '31 participated.

The 1930 Countryman women of the 1920s were remarkably busy people. Most belonged to at least four other organizations, including sororities, the Farmer's Week Committee, athletics, music and drama, not to mention various honor societies.

Opportunities for women in the Countryman continued to increase through the 1930s. Having five or more women on the staff became common. And more of the articles were being written by the staff, especially by those enrolled in the ag college's journalism courses.

In 1934, Elizabeth S. Foote '34 became the first female Former Student Notes editor, opening up yet another position for women. Still, all this progress could not conceal the fact that most of the women continued to occupy the lower staff positions, rather than the more prestigious editorial and managerial ones.

Not until 1937, 34 years after its beginning, did the Countryman see its first female editor-in-chief, Julia B. Bockee Winans '37. Winans credited Bristow Adams, a professor of journalism who was heavily involved in the Countryman, for her appointment. Describing her responsibilities as the editor-in-chief, Winans said, "I talked to the board about each issue. I mainly managed meetings and held things together."

As more articles were written by the staff, the tone of the magazine became less technical and more human interest. For example, Winans recalled a particularly memorable human interest article she wrote about male dancers who trained on local farms.

Winans was the first and last woman to hold the editor-in-chief position until the United States entered World War II in 1941. A year later, Margaret M. Lucha '42 and Marie C. Call Wells '42 became the co-editors-in-chief. "We were struggling to keep [the Countryman] going. Bristow Adams was our mentor and a big help to us. He was fantastic, and if he thought something was good, that was a gold star," recalled Wells, who is the sister of David L. Call '54, dean of the ag college.

Lucha and Wells shared the editorial duties, but Wells had quite an advantage because of her contacts. "My father and all six of his kids went to Cornell, so I knew a lot of the professors and local farmers," Wells explained. These were the people who wrote or provided information for the Countryman's articles, Wells added.

The war provided women with unprecedented opportunities to serve in all of the Countryman's staff positions. Lucha and Wells were succeeded as editors-in-chief by Marjorie R. Heit '43 in 1943. In fact, women continued to hold the editor-in-chief position through 1945.

As men began returning over the next few years, female editors-in-chief became less common, but the experience and foothold gained by women as a result of the war had long-lasting effects. During the early 1950s, the highest position attained by women was, once again, the women's editorship. But by the end of the decade, Natalie L. Gundrey '58 and Brenda L. Dervin '60 had both served as editors-in-chief, and several women had held upper editorial and managerial positions.

In 1963, the Countryman became a way for students to earn the ag college's required practice credits in agriculture. Competition for staff positions was eliminated; instead the positions were rotated among members of the class, as they are in the present Countryman. 1963 also marked the beginning of a magazine planned, written and edited exclusively by its staff members.

The changes of 1963 undoubtedly gave women even more opportunities to serve in the most coveted positions. But by this time the Countryman women did not need this extra boost. They and their predecessors had already proven themselves capable equals.

by Beth P. Goelzer '91

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SEX AS A WEAPON

THE DEVIOUS FEMALE SEDUCING THE unsuspecting male is a prevalent theme in our pop culture. Related to this theme, a group of Cornell entomologists have come up with an environmentally safe way to neutralize the grape berry moth, the most harmful pest to grapes grown in the eastern United States.

The entomologists have developed a synthetic pheromone which imitates the sex-attractant of female grape berry moths. The confused males fly in the direction of the pheromone expecting to mate. But because the male moth cannot locate the female, the moths cannot mate, and therefore, they cannot produce the harmful larvae that can ruin up to twenty percent of a vineyard's crop.

The man responsible for this safe alternative to harmful pesticides is Dr. Wendell L. Roelofs of the Department of Entomology at the New York State Experiment Station at Geneva. Roelofs first isolated the pheromone in the grape berry moth in 1970. However, it took his staff about fourteen years to come up with the best method of dispersal. “We initially tried mass trapping, then microcapsules, before settling on twist ties in 1984. After that it was a matter of testing to see how much was needed and when,” Roelofs said.

The twist ties are made up of eight-inch long polyethylene tubes, each containing enough pheromone to last 100 days. Vineyard workers attach the ties to the top trellis wires in the vineyard. “You don’t need any special equipment to apply the ties, except a pair of gloves,” said Roelofs.

Dr. Timothy J. Dennehy, an associate professor of entomology working with Roelofs, has conducted field trials of the ties since 1985. “When we release a cloud of pheromone throughout the vineyards, the male moths perceive the pheromone as coming from many directions and they become confused in their attempts to orient toward female moths,” Dennehy said.

The pheromone is an environmentally safe alternative to chemical insecticides currently used against the grape berry moth, such as carbaryl and the more toxic parathion. “The ties are safe because they are not put directly on the grapes. Therefore there is no harmful residue left on them,” explained Roelofs.

In addition to being environmentally safe, the pheromones have other advantages over insecticides. It takes six to 12 pounds of insecticide to treat an acre of grapes, whereas the pheromone requires only two-tenths of a pound per acre. The ties are also waterproof and only need to be applied once per season, unlike insecticides, which must be reapplied every time it rains.

And where insects can become resistant to chemicals, it is unlikely that they will become resistant to the pheromone. Because the pheromone does not select for a specific enzyme, there is little chance for selection pressure to offer any resistance.

The real disadvantage to using the ties is their cost. It would cost most grape growers twice as much to use the pheromones as it would to use conventional insecticides. According to Roelofs the costs will remain high until the pheromones are mass-produced in this country. In the meantime, Roelofs favors the idea of giving grape growers incentives for using the pheromones as way to offset the cost. “The government could give the growers some kind of tax write-off, much like the way Jimmy Carter awarded energy credits to families that conserved fuel during the late 1970s,” he said.

Although the ties were first introduced in 1985 they were not approved by the Environmental Protection Agency (EPA) until April of 1991. Roelofs blamed the six year wait on the slowness of the EPA. “The EPA likes to take its time dealing with applications coming in. Even though the pheromones are safe, they are still classified as pesticides, and still subject to extensive tests. A lot of the waiting was just bureaucratic bumbling. Our application got lost four or five times before it was even registered,” he said. Pheromones may soon be granted exemptions from such tests, which will speed up their approval.

Will pheromones become a common weapon against agricultural pests? According to Roelofs it depends on the niche of a particular crop. “The reason the ties work on the grape berry moth is because the grape berry moth is the only pest that has to be dealt with. If the grape had more than one pest attacking it, then growers would need different kind of pheromone for each pest. That isn’t practical,” he explained.

In the meantime the grape berry moth will fall prey to his lust, wandering aimlessly in search of his mate. However, the culprit is not the devious female, but man himself.

by Hank Grezlak '92
Think FALL
for Fertilizer

WHEN SPRING ARRIVES, many homeowners begin to think about cleaning the home, washing the car and fertilizing the lawn. But hold off on feeding the lawn. According to Cornell University turfgrass experts, early fall is the best time to fertilize lawns for optimal grass health and beauty.

Many homeowners wish to get their lawns lush and green as soon as they get their first scent of spring. But most people do not know that early spring fertilizing may actually harm their lawn when summer arrives. Early fall feeding may also help keep nitrates from contaminating groundwater.

According to Martin Petrovic, associate professor of turfgrass science in the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences, "Fertilizers will promote excessive shoot growth along with early color. But these results could be at the expense of a healthy and well-developed root system."

Early spring heavy fertilizing will not allow the root systems to fully develop and can cause injury to the lawn, especially during dry summers. The roots are responsible for transporting water and nutrients to the lawn.

To counter this problem, Petrovic suggests a fall feeding around Labor Day. Fertilizing at this time will allow for important root growth and produce vibrant spring color. "This is because some of the nitrogen remains in the soil after the ground thaws in the spring if a slow-release fertilizer is applied," Petrovic said.

Petrovic is also concerned with the effects of nitrate contamination of groundwater. Application of fertilizer to sandy, mild-weather areas in the late fall may lead to leaching of nitrates into the groundwater supply. Areas 50 to 100 miles from coastal waters tend to be affected. The areas of Ithaca, New York that Petrovic studied had sandy soil but harsh winters, so were not prone to large amounts of leaching.

Maintaining the quality of groundwater supplies is important. Nitrates in the water have been linked to human health problems such as "blue baby syndrome" where nitrates in the baby's formula water disrupts oxygen transfer to the blood system and gives the infant a bluish skin color. According to Petrovic, groundwater provides about 50 percent of the nation's drinking water on average, with some rural areas receiving up to 95 percent of their drinking water from groundwater.

Norman W. Hummel Jr., associate professor of turfgrass science in the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences, offers the following hints to promote a healthy and beautiful lawn:

- Spring is the best time to test soil. A soil sample should be taken to a garden center or cooperative extension office to find out what kind of fertilizer is needed or whether the soil's pH should be corrected (grass grows best when soil has a pH reading between 6.0 and 7.0).
- Early spring is a good time to apply a crabgrass herbicide (just when the forsythias drop their blossoms).
- Dandelion control is more effective in the fall than in the spring or summer.
- Cut the lawn no shorter than two inches. A lawn shorter than two inches may promote weed invasion and make the roots susceptible to insects, disease, heat and drought.
- Allow clippings to remain on the lawn in order to recycle nutrients and possibly reduce fertilizer needs by one-third.
- Do not overwater your lawn; water is precious and too much watering may promote leaching.
- If you are determined to fertilize in the spring, it should be late May, around Memorial Day. Also keep nitrogen to a minimum in the spring (one pound nitrogen per 1,000 square feet of lawn area).

According to Petrovic, knowledge of proper lawn-care practices can lead to a decrease in problems. For example, knowing the correct lawn size along with proper calibration of a lawn spreader can eliminate many problems. Lawn spreaders tend to become "looser" with age and tend to apply more product than the desired amount. Proper adjustments should be made to the spreader so "over-fertilizing" does not occur.

Most homeowners receive their lawn-care information from lawn and garden centers. These centers start stocking fertilizers early in the year, so it may take some time before the idea of fall feeding roots itself. Yet most people will agree that giving up lawn work to enjoy a beautiful spring day is a small price to pay for a lush, healthy lawn. An idea most of us will find easy to get used to.

by Shawn Vargo '91
Cornell's Own Glass Menagerie

Made by the father-and-son team of Leopold and Rudolph Blaschka, these creatures were part of a set ordered by Cornell in 1885.

by Renée Hunter '92

In 1885, A CORNELL BIOLOGY PROFESSOR ordered some "usual" equipment from the catalog of Ward's Biology Company for classroom use. That usual equipment was actually a 500-piece collection of glass invertebrate sea creatures made by the world-famous father-and-son team of Leopold and Rudolph Blaschka. Forgotten for many years, the glass animals are finding their way back into use at Cornell after years of sitting in locked cabinets.

"They [the glass animals] came to Cornell University for teaching, but were forgotten and boxed up," explained C. Drew Harvell, an assistant professor in Cornell's Section of Ecology and Systematics and curator of the Invertebrates Collection. But about 15 years ago, Thomas Eisner, the Jacob Gould Schuman Professor of Biology, rediscovered the century-old glass invertebrates when he pulled the models out of dusty cabinets. After years of neglect, some of the glass reproductions of various species of snail, squid, octopus, flatworm, jellyfish, sea cucumber and anemone, were already broken.

Because no one at Cornell taught about invertebrates at the time of Eisner's discovery, arrangements were made for the collection to go on permanent loan to the Corning Museum of Glass. At Corning, 40 pieces were restored before going on display in April 1991 as part of an exhibit focusing on the glass artistry of the Blaschkas.

But Harvell and Paul Feeny, the chairman of the Section of Ecology and Systematics, made arrangements for the collection to return to Cornell this fall. Funds are being raised by the Development Office to pay for further restoration of the collection and to build display cases in the atrium of Corson-Mudd Hall, where the collection will be housed.

While the display will start off relatively small, more of the 500 glass invertebrates will be added as they are carefully repaired. "A lot still needs to be done," commented Harvell. "Tentacles are broken off or broken in half. Therefore, it will take a couple of years to get them up and on display."

The Blaschka collection will prove useful for Harvell's students in marine ecology and invertebrate zoology. In the past, students did not have ready access to invertebrates in classes because of the inability to store specimens. "The whole reason the Blaschkas did these was that some invertebrates have soft, squishy bodies. In alcohol, they contract into small bodies and lose color," Harvell stated. "[The Blaschkas] tried to capture the splendor of invertebrates in a medium that could be a permanent record."

Glassworking was a traditional occupation in the Blaschka family. As a youth, Leopold, born in 1822, studied painting and apprenticed under a goldsmith and gem cutter. He later began to work with his father as a skilled lampworker. With time, he began to make glass marine animals and flowers. Like his father, Rudolph, born in 1857, was quite interested in natural history and became his father's assistant.

While the Blaschkas are well-known for their glass flowers in Harvard University's Ware Collection of Glass Models of Plants, it was their glass sea animals that first gave them fame. The first glass animals produced by the Blaschkas were commissioned in 1863 by Ludwig Reichenbach, director of the Royal Natu
ral History Museum and Botanical Gardens in Germany. After that, the glass animals grew in popularity and the Blaschkas made more sets in their family workshop near Dresden, Germany. The models were marketed and sent to universities all over the world.

The Blaschkas created precise and detailed works. The two men travelled all over the world to find animals to capture, examine and use as models for their glass reproductions. Illustrations of body structures were made before the glasswork was started. The completed glass figures were so close to the real thing, that the Blaschkas preferred to be called "natural history artists", rather than glass artisans.

According to David Westinghouse, the deputy director and curator of ancient glass at the Corning Museum of Glass, Leopold Blaschka described the team's works in an English trade catalog: "The models which I at present produce conjointly with my son Rudolph Blaschka do not only supply object lessons for museums, but also serve as means of instruction for universities, colleges, (technological institutions), and other scholastic establishments. The models represent the respective animals in animate or live state as far as figure, form, structure, and color are concerned, the species of larger dimensions being full length pictures whereas the smaller ones have been adequately magnified. The representations, which have, in many instances, been drawn from the very life, are the outshoot of a series of close observances and researches instituted by me and my son, during a succession of years, both on the seashore and in our own aquarium, subsequently in general, to judiciously consulting the various monographies [sic] extant...."

Many people wondered how the team could make such accurate and detailed animals. Leopold Blaschka once explained, "Many people think that we have some secret apparatus by which we squeeze glass suddenly into these forms, but it is not so. We have tact. My son, Rudolph, has more than I because he is my son and tact increases with every generation."

Leopold never trained another worker besides his son, so Rudolph's death ended the production of the glass treasures. But because of the Blaschkas' meticulous work, the "lucky find" of Eisner and careful restoration, their glass menagerie will live on.

C. Drew Harvell examines one of the 500 glass animals in the collection.

After being on display at the Corning Glass Museum, Cornell's glass invertebrate collection will be housed in Corson-Mudd Hall.
“DON'T FORGET THE HORSE-DOCTOR!” shouted Ezra Cornell to Andrew Dickson White, as White’s Europe-bound ship pulled away from the dock in the New York harbor in March 1868. A mere half-year from that day, in September 1868, the vision of Cornell University would become reality. But, as White's ship set off to Europe in March, the fledgling institution still needed books, equipment, and of course, professors.

White triumphantly returned from his travels that year, bringing to the faculty two highly distinguished educators: the “horse-doctor” James Law, professor of veterinary science at Edinburgh, and Goldwin Smith of Oxford, pre-eminent in the fields of history and politics. These two men established, in the earliest days of the University, Cornell's sacred link to people abroad.

This link has strengthened over time along with Cornell’s reputation as a premier institution of higher education. In the years preceding World War II, for example, scholars and scientists arrived at American universities in droves, fleeing Europe as Hitler rose to power. As a result, Nobel scientists Peter Debye and Hans Bethe came to Cornell, while Albert Einstein went to Princeton. Today, the International Students and Scholars Office estimates that Cornell employs 920 foreign academic staff members. The departments of food science and plant pathology contain some of the larger foreign staff constituencies in the area of agricultural studies. Such a vision never occurred to Andrew D. White back in 1868.

By the time of his arrival at Cornell University, the young professor Law had an outstanding reputation in veterinary science with several books and articles already published. Ezra Cornell, who had a background in farming, possessed only the highest regard for both Law and his field. Thus, Law was put in a position to pioneer modern American veterinary science.

Originally part of agricultural studies, veterinary medicine at Cornell rose from meager beginnings. Law's laboratories consisted of fields and barns, and he used one of the only four microscopes existing monellosis. Another Law pupil, Arthur M. Farrington '79, headed the U.S. Meat Inspection Service.

Law's foreign counterpart at Cornell's opening, Goldwin Smith, has gone down as one of the University's most beloved professors. Discontent with the English political scene while dealing with the suicide of his ill father, Smith was looking for a change. The concept of a radical, ground-breaking university in the United States appealed to Smith immensely. He hoped that the rustic, less sophisticated halls of Cornell would do him some good.

In his book entitled "Reminiscences of Goldwin Smith," Smith recalled his interaction with American students as "very interesting and pleasant." His fondness for them spilled over to the athletic field, where Smith and his students often engaged in various sports.

His brilliant history lectures, at once articulate, witty and sharply delivered, were attended by students and townspeople alike. Ithaca hotels overflowed with those who came to listen to the Oxford professor.

Smith endeared himself to his fellow professors as well, seemingly as happy with his stay at Cornell as they were with him. He admired and respected his colleagues, and they likewise revered him for his scholarly status.

"In my chequered passage through life there is no happier incident than my connection with Cornell," Smith once said, "... no years of my life have been better spent."

Ask a student today about the names Goldwin Smith and James Law, and they may only recall a building on campus. But those who recognize the importance of Cornell University's foreign connection would indeed agree that the days of Smith and Law could not have been better spent as they began the link between Cornell and people abroad.
The Graying Market

by Joshua Z. Kantro ’91

THESE DAYS MARKETERS ARE GOING to the gray market to make a few bucks. But unlike the underground black market, selling to the gray market is 100 percent legal. The gray market is a category of older Americans which is increasingly being targeted by marketers.

Businesses and advertising agencies have been doing their homework and have found that America is getting older. According to U.S. Census data, the older population—persons aged 65 or over—numbered 31.7 million in 1990. By 2030, there will be about 65 million older persons, two times their number in 1990 (see graph).

“The number of older Americans is growing steadily. People aged 85 and over are the fastest growing demographic segment in the U.S.,” said Professor Emeritus Phillip Taietz of the Department of Rural Sociology. Taietz, who has been researching and teaching about aging since the early 1950s, teaches the course “Aging: Issues in the 1990s” during the summer session.

The increasing number of older people is only half the story behind the graying market. The other key fact is that older people have most of the money. People aged 65 or over control more than 50 percent of the nation’s discretionary income and hold 77 percent of all financial assets, according to pewview (a supplement of pr reporter).

Christopher Whittle, a senior lecturer in the Department of Communication said, “Older people generally have more money and more time to spend it than do younger people.” Whittle, who teaches Advanced Advertising, emphasized that the older generation is probably the most important target audience today.

“Many retirees have the time to take long vacations. Younger people are lucky if they can take two weeks off from their jobs. In addition, older people no longer need to support children and can spend more money on themselves. Dad buys that sports car he always wanted. Mom finally buys that fur coat she’s been dreaming about,” explained Whittle.

Nina Glasgow, a senior research associate in the rural sociology department, agrees that many older citizens are well-off financially. However, she pointed out that “It is mostly elderly white males who are doing well. Women, minorities and rural residents have much higher rates of poverty.”

Glasgow has researched one aspect of the mature market—rural retirement communities. She wrote an article on the subject which appeared in the March 1991 issue of American Demographics where she reported that one-fifth of America’s non-metropolitan counties are havens for rural retirees. In her article, she wrote: “[Rural] retirement hot spots are located in all regions of the country. They have strong consumer demand for health care, housing and other goods and services. For many businesses, they could be new markets that lie off the beaten path.”

According to Glasgow, the travel and leisure industries are also trying hard to attract the gray market. For example, most major airlines offer discounts for customers over 62. A reservation agent for Trans World Airlines explained over the telephone, “We give a ten percent discount to senior citizens and to their companions—even if the companion is below age 62. This is an extra incentive to fly with us.”

But businesses must be careful when advertising their products to the mature market. Whittle explained that successful advertisements “talk to the person and not the birth date. Research has found that older people feel 10 or 15 years younger than they actually are. Advertisers shouldn’t portray them as old and gray.”

Whittle, 61, himself is almost a member of the gray market. He and his wife, like many other people their age, have already put their children through college and finished making mortgage payments on their house. Whittle summed up his own financial situation when he exclaimed, “Having raised and educated seven children, I now feel like a millionaire.” This is music to a marketer’s ear.
Irrigation’s Traveling Man

by Stephen Will ’92

ON A LUSH, GREENHILLSIDE IN PERU’S Sierra Mountains, two farmers tilled the soil with traditional foot plows. Professor Michael F. Walter of the Department of Agricultural and Biological Engineering (ABEN) approached the farmers to say good-bye after helping them improve their irrigation system. He asked one of the farmers where he could buy a foot plow for a souvenir.

Immediately one of the farmers offered Walter the one he was using, but Walter’s face, which always smiles even when he is not smiling, told the farmer he would not accept the gift. The farmer ran to his hut and quickly returned carrying his son’s toy foot plow, which now stands like a prized trophy next to Walter’s fireplace.

Since 1982 Walter has traveled to more than 20 countries giving farmers and engineers useful information on how to effectively introduce new technology into old irrigation systems. “Technology has to complement, not replace,” said Walter. The farmers and engineers, in return, give him applicable knowledge, as well as a few mementos, to help him continue his work in developing countries.

Walter has spent most of his time overseas assisting farmers in the countries of Sri Lanka, the Philippines, Indonesia, Nepal, Pakistan, Bangladesh, Niger, Rwanda, Kenya and Peru. His first extended stay was in India from 1984 to 1985, when he worked as an irrigation advisor for the United States Agency for International Development (USAID). Walter worked in conjunction with five universities to develop water resource programs.

Crucial to these programs was the need to make “students and faculty more sensitive to the people who were going to use the systems,” said Walter. “Many professionals in the Third World are as foreign to farmers as we are here at Cornell. Irrigation systems are human as well as hydraulic.” If engineers ignore the human aspect, explained Walter, then the irrigation systems will most likely fail.

The systems will also fail if communication breaks down. “You need to be sensitive to the fact that people may not understand you, or that you may not convey what you intend,” explained Walter. “In India, when they say, ‘No problem,’ that means there is a problem.”

Somehow, Walter always finds ways not only to communicate with farmers and engineers but also to get them to talk to each other. “He’s able to pull together different aspects in order to come to a solution,” said Tammo Steenhuis, an associate professor in ABEN who has worked with Walter since they both came to teach at Cornell 17 years ago. “He’s a good catalyst because he gets different personalities together.”

Another major part of Walter’s work, both foreign and domestic, is going out into the field with graduate students and supervising their research projects. In 1986 Walter worked in Niger with a student in the middle of the Sahara Desert. “The student was trying to learn how the local people operated traditional irrigation systems, and she participated in the management of modern ones,” said Walter.

“Dr. Walter has excellent relations with students because of his supportive nature. He takes a personal interest in students,” said Paul Robillard, PhD ’86, assistant professor of agricultural engineering at Pennsylvania State University who worked with Walter. “He is particularly effective at coordinating interdisciplinary research. He also has the very rare combination of academic theory and field experience to conduct these projects.”

“The two words most appropriate for Walter are energetic and enthusiastic,” said Norman Uphoff, director of Cornell International Institute for Food, Agriculture and Development. “This energy and enthusiasm is characteristic of him.”

In 1988 Walter journeyed to Indonesia where he visited several islands to find out what the Indonesians wanted in an irrigation system and to coordinate this with what the United States had to offer. He most recently traveled to Sri Lanka in March 1991 where he evaluated the progress of a program designed to rehabilitate a 2,000-year-old irrigation system.
From working in all these countries, Walter learned that, “There has to be local participation throughout the entire process [from planning to implementation], and you always have to go into the country with the attitude that whatever is being done is being done for a good reason. The [farmers] are not fools,” added Walter.

Why does Walter visit so many countries? “He’s really concerned about people—both individually and collectively,” said Gil Levine PhD ’52, interim director of the Center for Environmental Research and a colleague of Walter for 17 years. Irrigation plays a critical role in increasing food production in Third World countries, Levine added. “Anyone working seriously to improve these irrigation systems has to get a sense of satisfaction.”

Walter cares so much for individuals that when they are not happy he is not happy. Once while traveling through Nepal, Walter encountered a mother, her little boy and a baby, recalled Levine. Walter took a picture of the baby, but as Walter walked away, the little boy clearly showed his displeasure at not being included in the picture. “Mike felt disappointed for days,” said Levine.

“I primarily [travel] because of the strong interest among graduate students to do work that relates to water resource management,” Walter modestly explained. “By traveling I begin to understand other cultures and learn from them, like how to live without using up so much of the world’s natural resources. In learning about their technology I’ve begun to appreciate why they do things.”

Currently, Walter is examining the interface between government agencies and local people regarding irrigation systems in developing countries, the endurance of irrigation systems and water quality issues in New York state watersheds. He wants to take his current research and all the knowledge he has gained from his travels “and expand from irrigation into natural resources and broader watershed issues in the Third World. I would also like to take the lessons I’ve learned in the Third World and apply them to water quality in the United States,” he added.

After nearly ten years of traversing the planet, Walter said, “The most rewarding aspect is that I’ve gotten to know people from other countries well enough that they give me a hug and vice versa.”

According to Levine, the greatest reward for the people Walter has helped is that, “He has influenced USAID to think about issues associated with irrigation development more critically and broadly.” He has also helped farmers and engineers “utilize U.S. assistance more effectively in their own terms.”

Claimed Uphoff, “I wish we had more people like him.” ■
THE PERFECT FIT

THOUSANDS OF AMERICANS UNDERGO joint replacement operations each year to alleviate the pain of arthritis, cancer or the trauma of an accident. The surgery helps patients regain some mobility in their major joints—shoulders, elbows, wrists, hips, knees and ankles—and on many occasions, enables them to walk again. These patients receive joint implants to replace worn-out cartilage, the material that cushions the movement of bones preventing pain when one bends an elbow or knee.

Surgeons can now fit the implants more precisely, thanks to researchers in the Department of Mechanical and Aerospace Engineering at Cornell University. The engineers developed a computer system that designs joint implants tailored to fit each patient's body. The system allows surgeons to visualize how the implant will fit and move within the patient before the operation is performed.

The advantage of the new program is that it enables surgeons to manipulate pictures of three-dimensional bones and implants with a computer mouse, which can only move an object in two dimensions—up/down and left/right. "It was similar to making a video game in 3-D with only a joystick," said Dean L. Taylor, a professor of mechanical and aerospace engineering who designed the computer program.

In the past, surgeons would choose a metal implant for a patient from among a number of standard-sized ones. They would then try to match one of the sizes with the patient's joint on the x-ray. Since surgeons could only approximate the right size, many patients were often fitted with an incorrectly sized implant. As a result, the implants tended to loosen and become painful within 10 years.

The new computer program tells the surgeon the exact size needed to match the patient's bone. In the system, data from computerized tomography (CT) scans of the patient's bone are fed into the computer, which displays the bone in color, three-dimensions and dynamic motion to give the surgeon a useful image. Using this $30,000 computer system, surgeons select the precise size and decide if a customized implant is needed, as opposed to a standard-sized one.

As a result, more implants are shaped to follow the contours of the bone, fitting like one puzzle piece into another. The implants are, therefore, better able to handle the stress of daily activities. Since the technique is fairly new, no studies have been done to determine the new life expectancy of the implant. But the engineers predict that the device could last up to 50 years.

Once surgeons determine the size of the implant, they then face the task of inserting it precisely into the patient. The operation, which costs about $13,000, involves cutting off the tip of the knobby end of the bone closest to the joint and inserting the implant into the hollow opening. Replacing damaged cartilage, the implant acts as a cushion for the joint. "The attachment of artificial material to a natural part of the body is difficult to achieve," Taylor said.

The difficulty lies in preventing the bone from breaking once the implant is inserted. If the implant puts too much stress on the bone, the bone will crack immediately. If the implant puts too little stress on the bone, the bone will not have enough calcium and will break after it encounters a moderate stress, such as a game of tennis. "A correctly shaped implant will give the bone just the right amount of stress," Taylor said.

Facing a different kind of stress are children suffering from juvenile rheumatoid arthritis. The disease occurs when the body begins to attack its own joints, causing joints to become inflamed and often painful. Many of the victims cannot walk and need crutches or wheelchairs. This rare disease afflicts 1 person in 10,000, and doctors do not know what causes it or how to prevent it. "There may be a predisposing factor, but nobody's ever proven this," said Rita Calvo, a senior lecturer in the Section of Genetics and Development of the Division of Biological Sciences.

The longer lasting implants give new hope to many of these young patients. Twenty years ago, the implant procedure was only available for elderly patients because the device lasted an average of five years. "As instrumentation improves, surgeons are more willing to attack difficult joint problems in younger people," said Timothy M. Wright, the associate director of the Department of Biomechanics at the Hospital for Special Surgery in New York, which performs 2600 implants a year.

But the implant has its limits. "We're not trying to produce 'six million dollar men'. We want patients to tone down their lifestyles," Wright said. For example, a professional tennis star who receives an implant will still be able to play a friendly game but will never again compete in the French Open.

Most patients, however, wish for things that most of us take for granted. "A lot of these young patients just want to go to college and don't want to be debilitated by a disease that won't let them go to class," Wright said. The joint replacement procedure may someday give all of these teenagers the ability to walk out of their wheelchairs and into a classroom.

by Deborah Steuer '91
Bacteria’s Fixation with Plants

by Susan Green ’92

EVEN BEFORE THE IDEA OF CROP ROTATION was formally developed by the early Romans, farmers had been interested in maintaining the fertility of their fields. The Romans noticed the ability of legumes, (the family of plants which includes peas, beans, peanuts, clover, vetch and alfalfa) to enrich soil. Today we know this fertilizing ability of legumes as ‘nitrogen fixation,’ a process by which atmospheric nitrogen is changed into a form of nitrogen that is usable by plants.

In the 1880s, two German scientists, Hellriegel and Wilfarth, showed that legumes were different from other plants because they could, with the help of symbiotic microorganisms, fixate nitrogen on their root nodules. Hellriegel’s and Wilfarth’s data settled a 50-year-long debate about the existence of nitrogen fixation.

In the late 1980s, researchers at Boyce Thompson Institute for Plant Research in Ithaca, NY, made a major scientific discovery relating to nitrogen fixation. They discovered the first bacterium to conduct photosynthesis and fix nitrogen symbiotically within a legume plant. The bacterium was tentatively named “Rhizobium thomsponianum.”

Although Dr. Allan R.J. Eaglesham isolated P. thompsonianum in the early 1980s at Boyce Thompson Institute, it was not until several years later that work at Boyce Thompson Institute by Eaglesham, Joan M. Ellis, Mariangela Hungria, Ralph W.F. Hardy and others at the Kettering Research Laboratories revealed its photosynthetic characteristics.

P. thompsonianum is a biological nitrogen fixer and therefore reduces the need for chemical-based, synthetic nitrogen fertilizers. Most photosynthetic bacteria conduct photosynthesis in the absence of oxygen. “These bacteria can produce photosynthetic pigments in oxygen-containing environments,” said Dr. Tom Owens, assistant professor of plant biology in the Division of Biological Sciences.

The P. thompsonianum bacteria were found in Virginia sand. They are able to make the photosynthetic pigment bacteriochlorophyll because they have genes associated with photosynthesis. These novel bacteria also have genes to enable biological nitrogen fixation. Since synthetically fixed fertilizer nitrogen is energetically costly to the plant and hazardous to the environment, biologically fixed nitrogen is advantageous.

P. thompsonianum will only fix nitrogen in those leguminous plants which have a symbiotic relationship with microorganisms. In a symbiotic relationship organisms benefit from each other’s existence. In exchange for the help with nitrogen acquisition, microorganisms get a source of energy (carbon) and other nutrients.

But why aren’t all plants symbiotic nitrogen fixers? The Boyce Thompson Institute showed that legume plants have about 30 genes that are necessary to form a nitrogen fixing symbiosis. “Mutant pea plants were purposely made to study the lack of nitrogen fixation in certain plants,” said Tom LaRue, a biochemist at the Boyce Thompson Institute whose group developed the mutant pea plants. During evolution, it is likely that only a few plant species are able to assemble all the genes required for symbiosis with rhizobia.

According to Ralph W.F. Hardy, President and CEO of Boyce Thompson Institute, synthetic nitrogen fertilizers, along with chemical pesticides and genetic improvement, have been responsible for the increased crop yields of the last 40 years. During this time period, the use of synthetic nitrogen fertilizer has increased more than 20 times its original amount.

However, the environmental dangers of synthetic nitrogen fertilizers are even greater than those for chemical pesticides. “One reason for seeking biological alternatives to fertilizer nitrogen is the negative environmental impact caused by synthetic nitrogen fertilizers,” said Hardy. Since about only half of the fertilizer nitrogen put into soil is used by crop plants, the rest is free to either contaminate groundwater or form dinitrogen oxide, a greenhouse gas that contributes to global warming.

The Romans were probably not aware that their ecologically safe ideas for soil fertility would eventually evolve into serious environmental concerns. But the discovery of biological nitrogen fixers like P. thompsonianum show the effort of scientists to be environmentally as well as economically responsible.

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MANY STUDENTS IN THE COLLEGE OF Agriculture and Life Sciences spend four years at Cornell and never set foot on a farm of any kind. Therefore, it is not surprising that for the past ten years most recipients of the Hubert H. Humphrey Fellowship rarely had the opportunity to see examples of traditional American small-scale farms.

The Humphrey Fellows are professionals from developing countries involved in the field of rural development who come to Cornell to study. In the past, the Fellows' chance to gain first-hand experience on American farms was limited primarily on observing how the implementation of resource-oriented and technology-oriented farming systems increased the number of capital intensive and highly mechanized farms in upstate New York.

But in March 1991, participants of the 1990-91 Cornell Hubert H. Humphrey North-South Fellowship Program were introduced to the practices of organic farming when they took a field trip to two local examples of traditional American farms. The trip to Shamrock Hill Farm in Port Crane, New York and Northland Sheep Dairy in Marathon, New York brought the Fellows together with two local farmers who have made lifelong commitments to sustainable farming. Sustainable farming is the adoption of technologies and practices which will maintain and support a farm over time without causing soil depletion or furthering the dependence on external help.

"I wanted to make people realize that low-capital farms do exist in the United States, too," said Stephan Schad '91 who organized the visits. Schad, a German student in general agriculture in the College of Agriculture and Life Sciences, thought that field trips such as the one he planned for the Humphrey Fellows, could challenge the belief that small-scale farming is no longer practiced in the U.S. and that traditional farming systems are symbols of underdevelopment and backwardness.

However, for the last 50 years, scientists, rural development experts and policy-makers have placed emphasis on the shift from traditional farming to modern practices. Because of that shift, the support system which the early twentieth-century American farmers could and did rely on has been almost completely destroyed. As a result, today's small-scale farmers are often forced to face a competition able to produce and distribute its crops on a larger scale without support.

"Many international students or professionals often do not realize that small-scale farmers find it hard to make a living in this country, too," Schad said. "It is also important that the students are exposed to farming practices that are more similar to those used in their home lands."

Schad could not have found more responsive and enthusiastic participants than the Humphrey Fellows. Some of them did not know what to expect in their visits to the local farms. "I visited farms in Ohio, Illinois, Michigan and Wisconsin. But I never would have expected to meet farmers in this country who are facing similar difficulties and frustrations as encountered by farmers in my own country," said Marlen J. Bavia, Special Assistant to the Executive Director of the Cooperative Foundation in the Philippines.

According to Bavia, in the Philippines the necessity and the determination to maintain traditional farming practices are no longer issues within the field of rural development. "We have learned at the expense of our soil's health that fertilizers, pesticides and a variety of different technologies coming from the west could not be viable substitutes for our farmers' knowledge of the land," Bavia said.

Bavia's argument finds a historical context in the policies implemented during three or more decades of foreign assistance to the developing countries. Soon after World War II and up to the late 1970s, hundreds of aid programs tried either to fill the perceived 'technology gap' or the 'resources gap' that western governments, academics and development specialists considered to be causing
underdevelopment. These two approaches required some level of participation on the part of the beneficiaries of foreign aid. Yet, the farmers' skills and knowledge were not considered an asset, but rather traditions that stopped the country's natural course toward 'modernity.'

Although highly criticized by most of the new generation of development specialists, these interpretations of the participatory approach penetrated and modified the cultural background of many policy-makers both in the U.S. and abroad, interpretations that Michel Kayihura, Chief of the Rural Development Section for the Presidency of the Republic of Rwanda and one of the Humphrey Fellows on the field trip, believes elicited positive responses from agricultural officials in Rwanda who were trained in western universities. According to Kayihura, rural development experts still push forward intensive farming practices which rely heavily on fertilizers and pesticides.

"I am astonished to meet with U.S. farmers who, like Rwanda's peasants, complain about the use of chemicals. These American farmers not only argue [against the use of chemicals], but they also demonstrate through their endeavors that chemicals are unnecessary and even harmful," Kayihura said.

For farmers like Mike Kane, the owner of Shamrock Hill Farm, their work and commitment are proof that sustainable farming is successful and that economic efficiency can be acquired through practices that do not rely on expensive synthetic fertilizers or large machinery.

"Mike said that he can get what he gets from his farm because he knows the land. I agree with him because no one farm is like another. Every farm is a specific and unique entity. The adoption of technology cannot preserve the health of the soil, regenerate it and at the same time, contribute to efficiency, unless it is carried out with this awareness," said Vrinda Sarup, District Magistrate in Junpur, India and a Humphrey Fellow.

However, the difficulties and the isolation of Shamrock Hill Farm and Northland Sheep Dairies from the academic world led June Richards, Senior Planning Officer for the Ministry of Natural Resources and Energy in Swaziland, to consider the exposure she gained through the field trip as an introduction to the other side of the coin. "In this country there is so much research going on, so much infrastructure and facilities, yet there are farmers struggling as much as those in my own country," Richards said.

After a day spent visiting the two farms, it was natural for the Humphrey Fellows to wonder how this experience will affect their decisions as professionals involved in the field of rural development. For Zainab Binte Tambi, Nutrition Officer for the Medical and Health Services Department in Malaysia, the solution lies in the combination of different farming practices. "There is a need to promote sustainable farming," Tambi said. "Our work must be directed towards finding solutions which combine traditions and technology. It is part of our job to help the farmers integrate the level of technology that can be sustained by a farm with their economic needs."

by Lorella Sabatini '91
AFTER WORKING FOR SEVERAL HOURS on a history paper, Jeffrey Carmona '94 decides to put aside his books and write a letter to his best friend at Duke University. From his room in Dickson Hall, Carmona types a quick note on his Macintosh computer. But instead of printing out a hard copy and mailing it, he punches a few keys and within seconds his letter is on its way to Durham, North Carolina.

Carmona and 327 other Cornell students living on the fourth and fifth floors of Donlon Hall and the third floor of Dickson Hall are part of the Computer Network Pilot Project (CNPP). These students can now access high-speed optical-fiber communications networks for the Macintosh, IBM, or IBM compatible computers from their rooms.

The fall 1991 semester marks the first time such a program has been offered to students living in Cornell's residence halls. "The purpose of this pilot program is to determine what students need," said Fred DeWolf '81, MBA '91, Director of the Computer Network Pilot Project. "Before we decide to make the network available to all 6,000 students living in the residence halls, we want to find out what the students in the pilot use it for and if they find it worthwhile."

Students participating in the pilot program have access to library catalogs, Cornell's on-line information service (CUNO), electronic mail and bulletin boards and other campus information systems, explained Gordon Suggs '85, MBA '89, Assistant Director of Workstation Support Services for Cornell Information Technologies (CIT). In addition, students are also provided with low-cost laser printing facilities, the opportunity to lease a computer at a reduced rate, assistance from project coordinators for network-related problems and workshops on how to use software.

According to DeWolf, the University approved plans to implement the pilot program during the 1991-1992 academic year after several years of planning and revising proposals. One important factor in the University's decision was an agreement between Cornell and IBM to update and extend Cornell's fiber optic network to every building on campus, including the residence halls, claimed DeWolf.

Without using a modem and tying up a phone line, students in the pilot can transmit and receive data along campus, national and worldwide computer networks. DeWolf explained that once data traveling along the fiber optic ring reaches the residence halls, it is transferred onto unshielded twisted pairs of wires using Ethernet networking protocols (UTP Ethernet). The data is then sent up to the appropriate room and received by the student working at his or her computer.

"UTP Ethernet are essentially the same copper wires that the phones work on," said DeWolf. "When the University installed the current campus phone system (in March 1986), they provided every phone jack with two pairs of wires. One was for the phone and the other was installed with the intention of later running data across it."

Because the campus network is connected to other national and worldwide networks, students can communicate electronically with people throughout the world. "By expanding students' access beyond Cornell's systems, we are allowing them to jump out to the world and determine what it means to be part of the worldwide network," said DeWolf.

So far student reaction to the project seems positive. Eighty-eight students signed up during on-campus housing selection in March 1991—twice the number of students who signed up for those spaces in Donlon and Dickson last year, claimed DeWolf. The remaining spaces were filled with freshmen and transfer students who applied to enter CNPP over the summer.

Students from every college within the University participate in the project, a fact that Charity Sammis, the Residence Hall Director for Donlon Hall, believes has helped foster a sense of community among residents. "There is a broad base of people living here and they can help each other in learning how to use the software," she said. By sharing their common interest in the pilot project, students begin to interact with each other on other levels as well.

To participate in CNPP, students pay an annual fee of $56 for the network connection and $50 to lease an Ethernet card. "Because this is a pilot program, the University will take a financial loss on the network this year," said Sammis. However, both Sammis and DeWolf believe that the costs of using the network will increase if the project is eventually made available to all 6,000 students living in residence halls.

And if that happens at Cornell, the time is approaching when students everywhere will have network connections in their rooms and zip codes will be replaced by electronic mail addresses.

by Cheryl Jacobson '91
Series of Promotions at Geneva Station

Dr. Thomas J. Burr was promoted to a full professor of plant pathology at Cornell's Geneva experiment station. Burr's research concentrates on fruit crop diseases. He has achieved national acclaim for his findings on the crown gall disease of the grapevine, which causes damaging losses in New York and other regions around the world.

Two other scientists are also on the upswing at the Geneva station. Dr. Richard Straub, an entomologist at the station's Hudson Valley Laboratory in Highland, New York was promoted to full professor. Straub focuses a large part of his work on pesticide management procedures and alternative strategies for pest control. He began his work in the Hudson Valley in 1971 as a research associate.

Dr. Susan K. Brown was promoted to associate professor of the horticulture sciences department. Brown came to the department in 1985 and was appointed as the new leader of the station's world-renowned apple breeding program last year. Brown's research is geared towards developing improved apple varieties.

Cornell's Technology Aids in Discovery of Virus

With the high-tech help of the Cornell High Energy Source, one of the world's most intense sources of X-rays, researchers across the country discovered the three-dimensional structure of the canine parvovirus, which causes a highly contagious and sometimes fatal disease in dogs.

Researchers at Purdue University, the University of Alabama and the College of Veterinary Medicine's Baker Institute for Animal Health reported their findings in the March 22, 1991 issue of Science.

Michael Rossmann, who led the team of researchers, said the discovery of the single-stranded DNA virus will help shed light on human illnesses caused by parvoviruses, such as acute anemia, forms of heart disease, childhood erythema and fetal deaths.

According to Rossmann, the canine parvovirus is similar to RNA viruses like the common cold, which indicates that they may be related.

Vaccines for the canine-parvovirus are available but there is no specific treatment available to combat the virus in dogs who already have the disease.

Father of Public Relations Celebrates Birthday With PRSSA

Dr. Edward Bernays '12, Father of Public Relations, came to Cornell University in April to join students, faculty and public relations professionals in the celebration of his "First 100 Years."

Bernays, whose list of former clients consists of historical figures such as Thomas Edison, Eleanor Roosevelt, Henry Ford and Presidents Woodrow Wilson, Calvin Coolidge, Herbert Hoover and Dwight D. Eisenhower, presented the Keynote Address at PRSSA's Eighth Annual Awards Luncheon.

In his address, the public relations founder advised students to establish their own personal niche in whatever field they enter.

Bernays also presented an award, which he established in 1984, to the student who has contributed the most to the practice of public relations. Bernays, who is also the honorary editor of the Cornell Countryman, personally handed the 1991 Edward L. Bernays Primus Inter Pares Award to Judith H. Germano '91.

The PRSSA also presented ten other awards recognizing students' achievements in public relations.

Department of Health and Human Services Recognizes Professor's Achievements

Jeffrey Roberts, the chairman and a professor of biochemistry, molecular and cell biology, has been named to a four-year term on the Microbial Physiology and Genetics Study Section by the Department of Health and Human Services.

Roberts, who was selected on the basis of his competence and achievement, will review grant applications to the National Institutes of Health and survey the status of research in their fields of study.

Entomology Names New Department Chairman

Dr. Wendell Roelofs, Liberty Hyde Bailey Professor of Insect Biochemistry at Cornell's New York State Agricultural Experiment Station in Geneva, has been appointed chairman of the department of entomology at Cornell's Geneva station.

Roelofs began at the experiment station in 1965 as an assistant professor of biochemistry. During his career, Roelofs has focused on studying insect sex pheromones.

The newly appointed chairman, who is one of the leading scientists in his field, is frequently asked to present his findings at international symposia.

Roelofs succeeds Dr. George Schaefer, who served as the department chairman for eight years.
Head of the Class

by Benjy Kile '92

THE BELL RINGS AND STUDENTS RUSH in all directions. Lockers are flung open and books are taken out as the students head to their first class. As they enter the classroom, you sit at your desk and wait for them to get quiet. You take a deep breath. It is your first day as a teacher.

This is the fate that awaited nine Cornell students in early September, 1991 as they began the semester as student teachers in New York schools. The subject is agriculture and this is the final test for those who want to become teachers in the agricultural field.

"Cornell is one of two institutions in the state of New York that certifies teachers in agricultural education," said Jan Held Woodworth, a graduate teaching assistant in the Department of Education in Cornell University's College of Agriculture and Life Sciences.

Although there are few students majoring in agricultural education at Cornell, several students majoring in other areas attempt to become certified in the agricultural field. According to Woodworth, students interested in teaching agriculture come from many majors, including animal science, horticulture and natural resources. During their senior year, these students are connected to schools across the state of New York in order to practice what they have learned about agriculture as well as teaching.

Nine students are student teaching in the fall semester of 1991. One of those students is Chrissie Rizzo '92, an agriculture education major with specific interests in horticulture. She teaches ornamental horticulture at the Onondaga-Madison BOCES Lakeside Occupational Center in Syracuse, New York.

Before the semester began, Rizzo met regularly with her "mentor teacher" to discuss classroom policies and decide which parts of the class Rizzo would teach on her own. "I'm also preparing lesson plans and gathering learning aids, such as worksheets and movies, for my topics," Rizzo said.

In addition to the subject matter, student teachers must be prepared to face a classroom full of students. "I work with students of various capabilities and handicaps, trying to teach them to function as a team. I face discipline problems, test writing and grading and being observed by professors," Rizzo said.

Over the course of the semester, the student teacher will progress from merely "shadowing" the regular classroom teacher to actually teaching the class independently. "Each student teacher works out the exact process with the teacher that they will be assisting," Woodworth said.

Overshadowing the agriculture teaching field this year are trends showing the decline of jobs available for those wishing to instruct in agricultural areas. "I see fewer teaching positions in agriculture at the high school level for at least ten years," said Woodworth. This decline in job opportunities is due to the fact that agriculture is not a subject required by the state for high school curriculums. However, Woodworth believes that employment opportunities exist for those with an agricultural education background in business and industry at the employee training level.

"I'm optimistic about the future of the profession," Rizzo said, "I believe there is a real need in industry and society in general for talented people to teach agriculture. It is up to well-educated teachers to change the public perception and understanding of agriculture."

Despite the difficulties facing the agricultural teaching profession, students will still come to Cornell to prepare for the challenge of facing a classroom of students who want to learn about agriculture. Rizzo pointed out the rewards she sees in teaching when she said, "I'll feel the satisfaction of helping someone understand a difficult topic. I'll be able to watch my students grow in their knowledge, technical skills and in their confidence in themselves."
About the Issue

The environment is one of the most vital global issues. People everywhere are starting to become more concerned about the future of their surroundings. This issue of the Countryman features stories on new strains of wheat, composting, paper and plastic, and raising fish in barns. This issue also takes a close look at the College’s Department of Communication and Cornell’s new American Indian House.

On the cover:

A photo of Akwe:kon, the new American Indian House on North Campus.

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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, sexual preference, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.
NO ONE CAN TAKE GETTING INTO AN Ivy League university for granted. For some minority high school students, such a dream may be close to impossible. But Start Smart, a cooperative agreement between Cornell University and Tompkins Cortland Community College, can help minority students realize the dream of college education.

Created in December 1990, Start Smart strives to increase the recruitment and retention rates of under-represented minority group members at the two institutions. By providing financial and other means of support, Start Smart enables students to pursue their education at both TCCC and Cornell University.

"The education of under-represented minority youth is of great importance to us," explained Michelle Courtney Berry MPS '91, who serves as program coordinator of Start Smart and liaison between Cornell University and TCCC. "Studies have predicted that by the early twenty-first century, one-third of the U.S. workforce will consist of minorities," Berry noted. "It is therefore a national priority to promote the higher education of minorities in anticipation of their increasing role in society. As a person of color, I find it fulfilling to work for this program."

Start Smart recruits minority students from the upstate region of New York: Ithaca, Binghamton, Elmira, Rochester, Buffalo and Corning. A maximum of 15 students per year will receive Start Smart's financial aid packages, including grant money from an anonymous source as well as other benefits.

The students will first attend TCCC, where they will complete a two-year degree in their chosen field.

Once their requirements have been met, including above-average grades, the students will prepare for transfer to Cornell University. At Cornell, they will fulfill bachelor degrees in their majors in the College of Agriculture and Life Sciences, the College of Engineering or the College of Human Ecology. (The other colleges at Cornell have also expressed interest in the Start Smart program.)

The first three Start Smart students began at TCCC this fall; Berry plans for seven more to begin in January. Jay Spaker, a resident of Elmira, is majoring in TV/radio writing and production. Marcus Small, a native of Jamaica now living in Ithaca, and Alfred Cornell III, an 18-year-old Ithaca High School graduate, are both studying engineering science.

When Alfred Cornell's high school guidance counselor told him about the program, he was quickly swept up with enthusiasm for its potential. "I never thought I'd be able to go to an Ivy League school," he exclaimed.

The idea for the program was born from a meeting between Eduardo J. Marti, president of TCCC, and high-level administrators at Cornell, including Provost Maldon C. Nesheim, to discuss ways of increasing minority student retention at both institutions.

Meanwhile, Bill Thompson, Cornell University's Director of Equal Opportunity, was developing a program to encourage minority high school students to explore careers in information technologies and continue their education at the college level.

Recognizing the common goals of their ideas, Thompson and Marti decided to combine their thoughts and energies into a program to increase the benefits for minority students. The result was the Start Smart grant agreement, the first Ivy League university and community college collaboration of its sort in the nation, according to Berry. "It's a small, but important step at the local level," she added.

Randall K. Stewart '73, associate coordinator of admissions for the College of Agriculture and Life Sciences, is looking forward to working with the students, who will enter Cornell in the fall of 1993.

But his responsibilities began once Berry identified and recruited qualified students. Stewart counsels the students about their transfer to Cornell, serving as a Cornell contact as they work through the admission process.

"It's a College and a University goal to enroll more under-represented minority students," explained Stewart proudly. "Through Start Smart, we can help these students benefit from a Cornell education. We can put an Ivy League education within their grasp."

By removing the obstacles that block the pursuit of higher education, Start Smart opens doors for qualified students who prove themselves through a competitive selection process. But it's up to the students to cross the threshold, to fulfill their potential for the future.

by Debra G. Birnbaum '92
THEY ARRIVED IN 1976. WITHIN THREE years, they had invaded our homes and set off a craze that continues at an exponential rate. Today, just 15 years later, they can be found in about one out of every four American households while they flatten Americans’ wallets by more than four billion dollars a year.

These plundering attractions—which allow their users to enter a fantasy world where they can fight evil, fly on magic carpets, compete against Mike Tyson and race in a Ferrari—are video games.

They have set off such a storm of popularity particularly with boys and girls, ranging in age from six to eleven years old, that many people are wondering what effects these mesmerizing mazes and powerful planets will have on children. Will these electronic fantasies turn our children into little monsters? Or will they prepare them to become the computer whizzes of the future?

The Department of Communication helped to answer these questions at their Sixth Annual Cornell Communication Convocation on September 6, 1991, which was sponsored in part by Nintendo of America. The convocation welcomed the knowledge and expertise of six speakers who specialize in childhood education, communication, psychology, engineering and media fields.

Although many American parents worry that the video games will transform their children into violent creatures, the experts seem to agree that although video entertainment is a new area of research, mom and dad can relax. The speakers explained parents and children should be aware of some cautions, but they emphasized that people can learn a great deal from video games.

Dr. Robert Thompson, a faculty member of the Department of Radio, Television and Film in the Newhouse School of Public Communication at Syracuse University, said many of the fears of the effects of video games stem from its newness. "I think there’s a time element here," Thompson said. "Whenever a new medium comes up it sort of lets the other medium off the hook."

Thompson explained that first there were fears about certain movies, books and television shows. Now people are getting suspicious of the newest medium—video games.
Dr. Cynthia Scheibe ’76, MS ’83, PhD ’87, from the psychology department at Ithaca College, said that because playing video games appears to be similar to watching television, the public thinks that their effects will be similar to those that research has shown about television.

“It appears to be the same on some level, which is why I think people are saying ‘Here are all the things that happened because of television and now they’re all going to happen again because of video games,’” said Scheibe. “In five years we’ll have something else new, and people will all be horrified. I think that people are trying to piggyback video game fears on the fears that came out of television. [The effects of video games] are probably not going to be anywhere close.”

Scheibe, whose research focuses on how children understand what they see on television, explained that when people watch the average three to four hours of television a day, this viewing displaces other activities they could be doing. “You’re getting less exercise, you’re spending less time socializing with your friends, you tend to eat more, ... you’re reading less,” said Scheibe.

However, with video game playing, these types of negative effects are not likely to be as powerful, Scheibe said. “Video games are much more social because you’re often competing against someone so you’re actually talking to them. Television is not. Talking to someone while you’re watching television is interference,” said Scheibe.

In addition, Scheibe said, video games require the player to be actively involved and can teach valuable skills. “It’s really true that these video games engage people,” she explained. “That’s not a small thing because it’s not like television where it’s just there to mostly entertain you, and it kind of moves along without you. They [video games] require you to think, to plan and to problem solve, and those are all useful skills that most television in our country does not require you to do.”

Keynote speaker Professor Steven Silvern, from the Department of Early Childhood Education at Auburn University, agreed that video games teach children many important skills. “They provide an opportunity for children to make hypotheses, to attempt to discriminate, to look for patterns,” said Silvern.

Results from a study he did on the effects of video games on aggressive behavior should ease parents’ minds, Silvern said. In the study, he measured violent behavior in children who were involved in three different activities: playing the video game “Space Invaders,” watching the cartoon “The Road Runner,” and general playing.

Silvern found that aggressive behavior after the video game and the cartoon was almost equal, but it was significantly higher than aggressive behavior after general play. “Kids are no more aggressive after playing video games than after watching Saturday morning cartoons. We’re not talking about turning kids into violent monsters,” said Silvern, who has done extensive research on the effects of play.

Student opinion on the effects of video games came from Robert Whiteman ’94, who has a special interest and expertise in video games. Whiteman is the winner of the 1990 Nintendo World Championship. The video game whiz was one of 500,000 contestants from all over the country who participated in the local part of the tournament. After defeating everyone in his age group, Whiteman traveled to California to compete in the championship at Universal Studios where he outplayed 30 other finalists.
Whiteman said he started playing Nintendo games only about a year before the tournament but has played other video games since he was five years old. He explained that many people misunderstand the effects of video games. People often point the finger at video games when talking about their negative effects, he said.

"The child who sits in his room playing video games all afternoon, all weekend, who doesn't call up his friends,... it's not the fault of the video games," Whiteman said. "That means something else is wrong."

Whiteman disagrees with the theory that video games prevent people from participating in other activities, like reading or socializing. "I think it's the other way around," Whiteman said. "I think they're not socializing so they're playing video games. You can get hooked on video games."

Whiteman said that a skill video games help to develop is strong hand-eye coordination. "It can make you a better driver," said Whiteman, who is a computer science major.

Video games can also be a confidence builder, he said. "It's a very simple reward system. You do something right and you get a score, you get points. That makes a person feel good."

Thompson, who analyzed the effects of video games from a humanities point of view, said they contribute to our culture. Video games can be viewed as a form of art and literature, he said. "With video games, very young children are getting a real huge body of oblique, minute, sophisticated details about what is, after all, a form of storytelling," he explained.

Thompson also said video games could be used as a form of therapy, especially for people in nursing homes or handicapped institutions where they feel they don't have much control over their environments.

He suggested that video game playing could change the social hierarchy which exists in American high schools. "Highly skilled video players can gain "social currency," like those who are adept at playing sports," said Thompson. "The idea now is that a twentieth century model of technical proficiency can take the place of this... model of brute proficiency," said Thompson.

Video games can also be viewed as "on-job-training for the new literacy, the new skills being required in a world where all the rules are changed," he added. "When all is said and done, one can anticipate this revolution of the young where these video game kids are able to be the only ones who can run the place."

However, the feeling that video games are not harmful was not unanimous among the panel of speakers. Some argued that dangers do exist. Dr. Geri Gay PhD '85, director of the Interactive Multimedia Group at Cornell, said that there should be some caution in playing these games.

"I want to make sure that people understand that they are just a small representation of life. Life is ill-structured and messy. It isn't a neat little tidy game. Sometimes when we try to put these programs together, we give people the impression they can control things and there's an outcome and things are fair and good," said Gay, who uses visual data bases to develop interactive multimedia educational applications.

Scheibe also said the moral messages in video games are something to watch out for. The prominent "good guy, bad guy" theme, where the good guys are justified in doing what they want and the bad guy deserves what he gets, is "a dangerous lesson to take out in the real world," she said.

"We run around and blow up 100,000 Iraqis because they're the bad guys and we're the good guys and it's okay if we do it. And if they blew up 100,000 of our guys they'd be terrible people," said Scheibe.

Professor Michael Shapiro of the communication department said that a big problem with understanding the effects of video games is that the field is so new. Asked what kind of implications video games have, Shapiro responded, "I don't know, some good, some bad. It depends what you do with it."

Another issue which concerns Gay is the fact that video games are mostly played by males. She said that the games are designed with males in mind. "Girls don't play these games... I don't think women are brought up to shoot at things or take power or control over things," Gay explained. "Men have more of a different outlook: how to get power or control over the world around them. The games are set up that way."

Gay believes, however, that people can learn a lot from video games. "It can be an interactive process. People can construct meaning for themselves and be involved," she said.

So what is in store for these electronic gold mines in the future? According to some of the experts, the trend for the future is making the adventures and fantasies on the screen as close to reality as possible.

"I think adding more realism is going to happen," said Gay. "When the system gets more under stress, then we'll look more to simple solutions. When it seems life is getting very complicated, as a relief we can go into the little worlds and try to have a few moments where we can control things."

If anything can be predicted, it is that people will continue to enter the little worlds that video games offer. With sales at companies like Nintendo of America jumping by almost one million dollars a year, it is clear that the game is far from over.

by Leslie J. Gross '92
transplanting science

WALKING DOWN THE CORRIDORS OF the Plant Science building has been somewhat difficult lately; long columns of laboratory equipment line the hallways. “We simply do not have enough space,” explained W. E. Fry PhD ’70, chairman of the Department of Plant Pathology, “so some equipment has to come out here. There’s some very nice stuff in this hallway.”

In order to remedy the lack of space for both equipment and staff in Plant Science, and to meet the need for technological improvements in the facility, the College has proposed a four-part plan. The plan calls for an addition at the southeast corner of Plant Science, renovation of the existing structure, construction of a 200,000 square foot building on the site formerly occupied by Roberts and East Roberts halls, and the replacement of the greenhouses on Tower Road with new greenhouses and a conservatory.

These changes are necessary now, explained Kenneth E. Wing ’58, Associate Dean of the ag college, because, “We are experiencing a collision between new science and old buildings.” The Plant Science building, which dates back to the 1930s, was originally designed to hold teaching laboratories, classrooms and offices. “Most research was done outside, in the field,” he said. But the facility quickly became outdated with the rapid emergence of biotechnology and the development of team research. As a result, he said, “The academic departments [there] have been at a disadvantage.”

The proposed plan, Wing continued, provides for a number of improvements, including more modern labs and classrooms, an environmentally safe and effective fume hood exhaust system, air conditioning and better wiring. The changes will benefit teaching and research in the departments of floriculture and ornamental horticulture, plant pathology, and fruit and vegetable science, as well as the Division of Biological Sciences’ section of Plant Biology and the Bailey Hortorium, added Wing.

Funding for the project, whose total estimated cost may be as high as $75 million, according to Wing, has run into formidable obstacles. The instability of the state budget, coupled with the co-existence of several extensive projects on campus (including the upcoming renovation of Mann Library) which are receiving major funding from the state, is delaying the appropriation of the necessary capital for the project.

But Wing is confident that the changes in the Plant Science building will be completed by the end of the decade. Emphasizing that “The State University of New York Construction Fund does not like false starts,” Wing pointed to money that has already been given to the College for the planning stage of the greenhouse and conservatory construction as proof of the state’s commitment to this portion of the project.

Fiscal considerations aside, Fry is looking forward to the implementation of the plan, which allows for his department to be united “under one roof.” Fry’s department only has a portion of its faculty working in Plant Science because of space constraints. “The biggest problem [now] is a lack of interaction between researchers,” he commented. “Things like the sharing of ideas and technology are difficult.” Under the proposed plan, the plant pathology and plant biology departments will move to the new ag quad structure while other academic units will be given more space in the renovated building.

Dr. Andre Jagendorf ’48, who chairs plant biology, sees both advantages and disadvantages in the upcoming changes. Recalling that his current office, Plant Science 261, is the same room where he was counseled as an undergrad in the 1940s, he noted regretfully the “break in historical continuity” that will occur. He pointed out that any move of this magnitude is bound to be disruptive to ongoing projects for a while. But he also observed, “All of us are looking forward to the possibility of more modern quarters.”

by Jeff Grant ’91

Built in the 1930s, Plant Science does not meet the needs of today’s researchers and their equipment.
MOVE OVER CHICKENS, HORSES AND pigs. A new animal will be moving into the barn. That's right, they're fish.

Aquaculture experts in Cornell's College of Agriculture and Life Sciences are helping an eager group of Finger Lakes residents to build and manage fish farms in area barns.

Why, you ask? Because these residents are also fledgling entrepreneurs. They hope to provide their hometown restaurants and supermarkets with fresh, uncontaminated fish all year long at premium prices. They are using abandoned dairy and cattle barns to house the huge fish tanks.

Eight residents in the Finger Lakes region have banded together to form the Northern Fresh Fish Cooperative so they can share expenses and Cornell technology. Professors here will teach members how to build indoor, closed-system fish tanks that will be used to produce 2,500 fish in a mere 11 months.

"That's three times faster than what you see occurring in ponds today," said Laurene M. Gilbert, chairman of the cooperative's board of directors. A landscape architect at Cornell and a Danby resident, Gilbert said that she is in the midst of building a circular tank with a 12-foot diameter.

Fish farms across the nation are closing as fast as they open. But this project has a unique character. Not only does it combine new technology and boundless spirit, it also has a solid game plan.

The operation of most fish farms suffers from competition with fisheries in seasonal sales. These residents, however, were able to solicit prospective buyers of the fish before they committed themselves to the cooperative. They sold the idea to supermarkets and top-notch restaurants based on the belief that their product, with Cornell's new technology, will be the cleanest and freshest fish around.

Restaurants who serve fish were definitely interested in the project and those who didn't, wanted to get involved," Gilbert said. The cooperative expects to sell each fish for about $3.

The Finger Lakes region is known for its fine food and wine cuisine. One of Ithaca's culinary gems, Turback's, is very interested in the cooperative. Turback's chef, Chris Chierchio, said, "Fish are more expensive in the off-season. This cooperative will help to keep prices down."

Chierchio said that because Ithaca is not centrally located, it is very hard for fisheries to deliver fish in the off-season. "In the winter, people come into Turback's asking for fish. If this project works, I'll have no problem serving them my specialty, fish with a chardonnay sauce served on puff pastry."

Local markets also have great hopes for the success of the fish farms. Brian Seely, a supermarket manager in Wegmans in Ithaca, said, "Every day in the winter, people come in asking for fresh fish. Let's hope this project works."

The fish the group plans to produce will meet restaurant and supermarket standards. Initially, the group will produce rainbow trout, weighing approximately one pound each.

But growing 2,500 pounds of fish in 2,500 gallons of water doesn't give the fish much room to breathe, through their gills, that is. Here Cornell's new technology comes to the rescue.

Professor Michael Timmons, who teaches agricultural and biological engineering, co-directs the Cornell Aquaculture Program. He and his team have devised innovative techniques to maintain fish farms without having to constantly change the water, a costly expenditure that has financially destroyed many fish farms.

With so many fish in a cramped environment, waste control can be a heavy burden. "Looking at the pound per gallon ratio, you can see that there's going to be a lot of waste," said Timmons.

The centerpiece of their design uses a rotating biological contactor that removes waste quickly and inexpensively. The contactor is a home for beneficial nitrifying bacteria, which, according to Timmons, literally eat the waste products from the fish. Fish farm owners will therefore have to change the water less frequently.
In addition to removing waste, the rotating contactor maintains the perfect temperature for fish to grow. Near the contactor, bubblers in the tank will provide the fish with a steady source of oxygen.

The aquaculture team has also experimented with finding the perfect type of fish feed. "A few years ago, people could hardly keep fish alive for over a few months because nobody knew what to feed them," said Gary L. Rumsey, a professor of avian and aquaculture sciences.

To solve the problem, Rumsey explained scientists first learned what the basic nutrition requirements were for the fish, and then went about creating the perfect food. Again concerned with minimizing waste in the tank, Rumsey said, "We are faced with creating an optimally digestible feed that will make fish produce little waste." The scientifically formulated feed that will be offered to the members of the cooperative, according to Rumsey, will consist mostly of soybeans and corn.

Once the farmers grow the fish, however, they still face another hurdle. How do they prepare and distribute the fish to their buyers? Enter fish food technologist Joe M. Regenstein '65, MS '66, of the food science department, to save the game.

"These people do not know how to clean fish," said Regenstein. "They do not know how to filet fish. They do not know how to distribute fish."

Regenstein said members will learn how to cleanly cut the heads off fish. "You can't just hack at it, it has to look attractive to the buyer. The project must be carefully thought through so that they can optimize their product's quality."

Cornell's hand-holding involvement stems from the lack of experience within the group of residents. All the cooperative members have gone for them is high hopes backed with sizeable investments. Each resident will invest $12,000 in the project, according to Gilbert.

The first tank went up in Danby in mid-September 1991 and additional tanks will be created at a rate of one per month. Scheduled to open her tank in January, Ginny Farmer of Lansing, NY, said, "My husband and I have always wanted to start a business on the side." Farmer added that she expects profits in just two years.

Norman Scott, Cornell's vice president for research, also expects the project to be successful. He explained that America is on a fitness kick and he expects fish consumption to increase throughout the country because, "Not only is it tasty, it's also healthy."

He also said that the cooperative's decision to use old barns is a wise move. "Because the dairy business is in a slump, acquiring used barns shouldn't be a problem," he said.

Although the cooperative will initially market rainbow trout, Scott said that in time, the fish farms will also produce salmon and jumbo shrimp.

The cooperative's future looks prosperous. The Cornell Aquaculture Program plans to continue aiding the cooperative as it moves past its preliminary phase. And cooperative members show that certain spunk associated with any new business venture. Farmer captured the essence of the project's wild future when she said, "My daughter thinks that I am crazy, but I don't care."

by Neeraj Khemlani '92
Paper or Plastic?

IT HAS HAPPENED TO ALL OF US.
The question strikes fear in the hearts of diligent grocery shoppers everywhere. "Paper or plastic?" The checkout clerk looks at you with that impudent I've-got-you-over-the-coals-now look, chewing her gum and watching you squirm under the question's weight.

You are surrounded by strangers who suddenly have their eyes riveted on you, boring holes through you. No matter what you answer, half of them will hate you for the rest of your living days.

But the paper or plastic issue is not as clear as some people would like to think. Both have advantages, of course, but these advantages must be weighed against their disadvantages.

"I always get paper," said Rachel Grover '93. "At least it biodegrades. You can't say that for plastic."

While Grover's opinion may be in the majority, it is quickly being disproven. According to Professor Bruce Ganem, a professor of chemistry at Cornell with an interest in biodegradable polymers, much progress has been made recently in the area of biodegradable plastics.

"What you want to do is take advantage of exposure to the environment," said Ganem. "Small fragments [of a degraded plastic] may disappear into the soil or be rinsed away by the rain."

There are two kinds of polymer degradation (plastic decomposition), said Ganem: photodegradation, which depends on light, and biodegradation, which relies on microorganisms to metabolize the polymer.

Here plastics take a body blow. Photodegradable plastics simply are not going to degrade in a landfill, where no light hits them.

For this reason, much research is focusing on cellulose-based plastics, which are biodegradable. These are plastics made from cellulose, which comes from trees. These plastics thus solve another environmental problem posed by conventional plastics—depletion of the irreplaceable resource of oil (which all conventional plastics are made from), as compared to replaceable trees. The cellulose is chemically modified to form a plastic which is biodegradable by microorganisms.

It would be possible, theoretically, to compost cellulose plastics with mass quantities of the microorganisms capable of breaking down the plastic, "but there's a limit to how much people are willing to separate their garbage," explained Ganem.

"Hopefully, biodegradable plastics will be safe," Ganem said. "Ideally, they would break down to carbon dioxide, which is about as safe as you can get."

While plastics are much maligned for not breaking down in landfills, their paper counterparts are not much better at landfill degradation. For this reason, a paper bag has been developed which incorporates starch into its construction. Starch is broken down quickly and easily by many different microorganisms, Ganem said.

Presently, scientists are conducting research on making plastic out of wheat and cornstarch, and even on fabricating plastic from table sugar.

The problem encountered with many of these solutions is that the plastic is weakened by the addition of cellulose or starch, and thus more of it has to be used, which slows down the degradation process again.

Degradation concerns aside, plastic and paper are still on fairly even ground. Some people may choose paper bags because they stand on their own, while others opt for plastic bags because they have handles. Some people find it easier to reuse paper bags, while others reuse plastic bags more.

Nanako Watanabe '93, for example, is a proponent of plastic bags. "They're easier to hold," she said, "and the frozen stuff doesn't ooze out through plastic."

Similarly, Todd Beck '94 chooses plastic. "They work better in our wastebaskets," he said.

So next time you're in line at the grocery store, keep in mind that the paper or plastic issue is multi-faceted; the pros and cons of each must be weighed before an opinion is formed. Not that this knowledge will save you from disapproving glares in Wegmans or Tops, but it may ease your conscience a little. ■

by Janet M. Clesse '93
NAMED AKWE:KON (A-GWAY-GOHN), a new residence on North Campus (at the corner of Triphammer and Jessup roads) seeks to represent a diversity of Native Americans and non-natives. Taken from the Mohawk language, Akwe:kon means "all of us."

Residents of the program reflect diversity. "Not only do we have many tribes represented like Eskimo, Pueblo and Choctaw but many non-Indians like Filipino, Japanese and African-American," explained Brendan White '93, a Mohawk student.

As director of the American Indian Program, Ronald LaFrance MS '85, oversees the mission of Akwe:kon. Going to Cornell or any college should not feel like a break from the family, LaFrance said. To him, a family provides a necessary sense of community. Breaking from this community hurts the student.

Instead, said LaFrance, Akwe:kon should serve as an extended family where Indian and non-Indian individuals can interact. "I see these individuals like a bouquet of flowers. They interact to make the bouquet, but one flower is not prettier than another," he said. Sunday community dinners encourage interaction and unity among residents.

Residents of the house bonded during an orientation period. "The program really rolled out the red carpet," White said, adding that house members quickly gained familiarity with each other.

Students living in dormitories or off campus don't experience a family-like community, explained LaFrance. "In the three short weeks that these students have been together, they have become a functioning unit," he said. Community, he said,

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**AKWE:KON.**

It is a Mohawk word meaning "all of us." It is also a building whose structure and decoration embody the essence of Native American culture.

From the brilliant dashes of purple illuminating the house's exterior, to the intense earth tones captured in the grain of the wood used in the construction of the external walls, Akwe:kon strives to capture the substance of the Native American way of life.

The design of the building is laden with allegory to Native American culture. The likeness of the Hiawatha Belt is found in the arrangement of several windows on the building. The Hiawatha Belt is the founding record of the Iroquois Confederacy, according to the September 5, 1991 issue of the *Cornell Chronicle*.

Furthermore, the most sacred record of the League's establishment, the Circle Wampum, is replicated in the center window of the house. The Circle Wampum is a belt composed of fifty strings of wampum. As stated in the Fall 1987 issue of the *Northeast Indian Quarterly,* each string represents one of the original fifty chiefs of the Haudenosaunee, or Iroquois, as the French called them.

Wampum, an important bartering device, signified wealth among certain Native American nations. Indicative of its widespread acceptance, wampum virtually guaranteed the sincerity of a message or vow, according the same article. Purple, the color of wampum, is the only color used to accent the house's exterior.

The Wing, or Dust Fan Belt, also contributes to Akwe:kon's representational motif. This belt, depicted on the exterior walls of the house, symbolizes an everlasting white pine tree. According to Stephen Fadden '89, MPS '92, an Akwesasne Mohawk, lecturer for the communication department
serves as the glue that holds the house together.

Heather Hill '95, part Ramapo, said that the house has especially helped her because she knows more upperclassmen than her freshman peers. Academically, they are a helpful resource, she added. "Being in the house has been very positive for me," she said.

Hill serves as secretary for Akwe:kon's self-governing council committee. The council, chaired by White and Tadashi Sakashita '94, has been reworking the house constitution. According to Hill, "The council will serve as a governing and support body for the students."

The council's subcommittees cover other issues. One subcommittee formulates house policy on rules and regulations covering the residents. An extracurricular subcommittee sponsors house teams in intramural sports. Sakashita noted that a subcommittee plans on holding an event with Ujamaa, the African-American house.

The students who wish to participate in the program apply to the selections subcommittee of the council. Students in Akwe:kon then select the new members.

The benefits that participants in Akwe:kon can expect are academic assistance, counseling, financial assistance and participation in activities. LaFrance believes that students will also learn to be accountable for their actions. "That is a part of life," he said.

As part of the American Indian Program, Akwe:kon will have an indirect impact on the Cornell student body, according to LaFrance. He feels that the house will in some ways affect the social ecology of students. About ten percent of and consultant to the American Indian Program, this tree is one that grows so tall that, "All nations of the earth can see it, come toward it, and take shelter beneath its branches, provided they bury weapons of war beneath the tree."

The apparently T-shaped structure of the building also holds great meaning. When viewed from above, Akwe:kon is shaped like an eagle. "The eagle is a sacred bird to us," explained Fadden. "It is a bird that sits atop our tree of peace, a white pine. Each white pine tree holds five needles per cluster, each needle representing one of the Five Nations. The white pine used to be the tallest tree in the forest, and the eagle sat on top to watch over us and warn us of danger." So a white pine tree grows in front of Akwe:kon.

On the corner of Triphammer and Jessup Roads stands Akwe:kon, an architectural monument to the achievements of the American Indian Program. This building is a testament to the effort and time spent in trying to establish a valid program and to recruit new students. Fadden, reflecting on the significance of the house, said, "It encompasses history, from our reverence of the past to our eye on the future. When I walk into that house, I feel like I've stepped into history."

Akwe:kon.

For some, its structure is not just another example of innovative architecture. It is the culmination of several efforts to finally make the dream behind the American Indian Program a reality.

For some, Akwe:kon is home.

by Allan Wai '93
undergraduates take classes in the American Indian Program, exposing them to "a different perspective that is not offered in high schools," said LaFrance.

An unusual policy in Akwe:kon is that parents and family are allowed to stay in the house on visits to their children. "When one person's parents visit, all students can feel like they have parents visiting," said LaFrance.

The attitude at Akwe:kon is that the program has something to offer to 'all of us' as a community of family and friends.

by Brett Ainsworth '92
A Meatless Way of Life

MARTHA MILLISON '93 HAS CHOSEN TO FOLLOW THE same diet that Leonardo da Vinci, Henry David Thoreau, C.W. Post and George Bernard Shaw observed. Millison, like the famous people who preceded her, is a vegetarian.

Vegetarianism is not, however, limited to the intellectual elite. In fact, the eating trend is more popular than ever before. The number of American vegetarians has steadily increased over the last twenty years to seven million today, according to a Washington Post article published in May 1990.

More and more people are choosing a meatless life for a variety of reasons. However, one of the most common motives for becoming a vegetarian is to promote personal health. Millison, a vegetarian since 1984, said that her vegetarian diet is more healthy than a diet centered around meat. "I am disgusted with the idea of eating something dead," she added.

Christina DiGiusto, a librarian at Mann Library, stopped eating red meat ten years ago, and last year she decided to eliminate meat and fish entirely from her diet. She, too, is concerned about animal suffering. Many agricultural industries treat animals inhumanely to prepare them for consumers, she said. Like Millison, DiGiusto feels that a vegetarian diet is best for her long-term health.

But is a vegetarian diet in fact nutritionally sound? And can it really improve long-term health?

The American Dietetic Association would probably answer yes to both questions. The ADA has recognized that, "A growing body of scientific evidence supports a positive relationship between the consumption of a plant-based diet and the prevention of certain diseases." Many studies have shown that vegetarians are at a lower risk for many common American illnesses such as heart disease, diabetes, colon cancer, hypertension and obesity.

But Professor Dennis Miller of the Department of Food Science cautioned that the relationship between vegetarianism and good health is not as clear cut as many people make it out to be. Miller cited studies of Seventh Day Adventists—a group which does not eat much meat—as an example of how conclusions can be misleading.

Researchers found that Seventh Day Adventists had a lower rate of heart disease than the average American person. However, Miller said, it is important to realize that Seventh Day Adventists are generally nonsmokers and have a higher overall health consciousness. These factors might also contribute to the lower heart disease rates. It is not always easy to separate diet from other activities.

Yet Miller does feel certain that there are some long-term health benefits associated with vegetarianism, particularly in terms of heart disease. "Vegetarians usually have higher intakes of dietary fiber. One type of fiber, soluble fiber, tends to lower blood cholesterol levels. Also, vegetarians tend to consume less fat because meat has a higher fat content than cereals and legumes," Miller said.

Professor Donald Beermann of the Department of Animal Science pointed out, however, that switching to a vegetarian diet does not automatically mean less fat in the diet. "Vegetarians might be increasing their fat intake because some tend to rely heavily on oils for frying vegetables and for salad dressings. In addition, many rely on nuts for their protein. But nuts have higher saturated fat content than meat."

Health benefits also depend on what type of vegetarian you are. Lacto-ovo vegetarians eat dairy products and eggs. Consequently, they have higher fat intakes than vegans, or strict vegetarians, who do not eat any meat or dairy products.

In terms of daily nutrition, there are certain things vegetarians must watch out for. They must consume adequate amounts of protein, iron, calcium and vitamin B-12. Millison and DiGiusto are very conscious of the food they eat. Both were anemic temporarily, but have had no other nutrition-related health problems. DiGiusto now takes an iron tablet daily.

"Vegetarians, especially vegans, need to be more careful in making food choices to insure adequate intake of vitamins and minerals," said Miller. "Plant foods tend to have a narrower nutrition profile while meats and dairy products are good sources of several vitamins and minerals."

Beermann and Miller both agree that a vegetarian adult, whose diet is chosen from the four basic food groups, substituting wisely for meat, can maintain a healthy and well-balanced diet.

by Joshua Z. Kantro '91
If you were given a dollar for every pound of food waste generated by Cornell Dining, in less than nine months you would be a millionaire.

According to Walter Smithers, Cornell University's Solid Waste Manager, Cornell Dining disposes of two tons of food waste every day. Currently, this garbage is taken to a landfill, where it just sits and takes up space. But there is a more environmentally constructive alternative to disposing of this waste: a technique called composting.

Professor Joe Regenstein '65, MS '66, a fish food technologist in the Department of Food Science, explained that composting is a process in which food and other organic waste break down into a more usable compound called humus, which can be used to enhance soil. Currently, he and other researchers at Cornell are looking into how composting could work in conjunction with Cornell Dining.

Smithers is now preparing a proposal to present to Cornell Dining, suggesting that the dining halls begin composting all the food waste they generate. He explained that if all of the food waste were composted, it would reduce the dining halls' total garbage output by approximately 45-50 percent.

Smithers' challenge is "to come up with a program by which Dining can take the amount of money that they are spending to get rid of food waste now, and convert that into equipment and labor to run a composting program." He added, "Hopefully it will cost less than what they are spending now," in which case the plan for composting may become a reality.

Tom Richard '87, of the Department of Agricultural Engineering, who has been working with composting for the past three years at Cornell, is rather certain that Dining will accept the proposal. The reason, he explained, is that by January 1, 1992, Tompkins County will probably almost triple its tipping fees (the amount of money charged to dispose of garbage).

"With the increase in the tipping fees we can start to make some significant savings [by using composting] even in the first year," Richard said. "And because it will be cheaper, I think it will happen."

Smithers estimated that it currently costs Cornell Dining about $48,000 annually to dispose of its food waste. With the increase in the tipping fees, that cost will be over $100,000. This tipping fee escalates beneficial for Farm Services at Cornell, Regenstein explained. When the humus is mixed with the soil, it makes it better able to hold water, and also gives the soil important nutrients. Because this end product of composting is usable for agricultural purposes, it may replace the cost of materials that are currently being purchased.

"From a social perspective it makes a lot more sense to compost than to put the waste in a landfill where it takes up valuable space that could be used for other things," said Smithers, adding, "The compost will be a valuable commodity." It can be used by the Grounds Department, Cornell Plantations and Farm Services to enhance their soil organically.

Other types of institutions and industries are also beginning to look to composting as a means of disposing of food waste. Smithers cited about 30 prisons across the state and a YMCA in the Catskills that have begun food composting projects, all have which have been successful so far. The Town of Ithaca has been encouraging residents to build their own compost piles in their yards, helping to reduce their amount of garbage output. However, according to Regenstein, for home use, the composting of animal-based food wastes is not recommended.

Composting is also being used on an even larger scale. For example, American Composting Technologies (ACT) manufactures machines that compost waste from food companies and other industries. Hugh Hudock, vice-president of ACT, explained that his machines completely compost materials in 21 days, "something that would take nature 4 to 6 months to do on its own."

Hudock and his associates currently choose not to compost meat products because of the potential odor and the problems involved with having to combine the meat with other compost materials in the proper ratios.

"Food waste [containing animal products] is fairly critical in the first couple of days because . . . it is still attractive to animals," Richard said.

He explained that the way to get rid of the animal-appealing qualities of the mixture is to "get the material heated up in a fairly rapid fashion in a contained manner." According to Regenstein, as soon as the waste is combined with oxygen, carbon, and nitrogen, it begins to produce heat. The entire mixture may reach a temperature as high as 150 degrees Fahrenheit. This heating causes the materials to decompose. Richard explained that the use of agricultural feed mixers will enable this to be done quickly for the Cornell Dining plan.

Smithers added, "The key is to get the biological processes going so that the food is breaking down." He cited a composting
operation in Maine which involves fish waste composting. The many sea gulls which fly over the area were not attracted to the waste once the composting process began to work.

Back at Cornell, Regenstein and Ali Reich '93 worked this summer on composting a sample of food waste, containing animal products, from Jansen's dining hall in Noyes Center. The end product of the waste was something which resembled peat moss.

Regenstein used a self-designed system, which consists of four-foot high cubed containers, called "totes," made from recycled plastic. Using this method, the food waste along with waste from the polo barns is put between a top and bottom layer of peat moss, which, "because of its acidic nature, traps the volatile compounds in the waste." The waste then breaks down into usable materials.

Each tote can handle about 1500 pounds of waste, and can be used indoors. Regenstein explained that these would be used for smaller operations, such as retail fish stores and supermarkets, and that they would not be suitable for the Cornell Dining plans. A main benefit of the totes is that they can be put indoors.

Cornell currently is the only university that has a set of food composting plans, according to Richard. "I think that if Cornell starts food composting, it will definitely serve as a model for other universities," he said.

Regenstein, Richard, and Smithers all project that Cornell Dining could realistically begin composting this spring. But nothing is definite. "Ultimately if this happens or not will be up to Dining," Richard said. "Dining is the one that has the bill for disposing of their waste.""
The Wheat Smell of Success

GENEVA. WHAT DOES THAT NAME bring to mind? European capitals, Swiss bank accounts? Perhaps. But ask any farmer in New York state, and they'll tell you Geneva is a new wheat taking the farming industry by storm.

Geneva wheat is a soft, white winter wheat developed at Cornell's Department of Plant Breeding in the College of Agriculture and Life Sciences. Professor Mark Sorrells released the variety to the public in November 1984, after more than seven years of research.

Since then, the popularity of Geneva has heightened dramatically. In its first year on the market, Geneva accounted for 8 to 10 percent of the wheat grown in New York state. Now, 40 to 60 percent of wheat grown in New York is the Geneva variety, and Sorrells predicts possibly higher figures for the next year's planting season.

What makes a variety so popular? According to Sorrells, "It all depends on the farmer's reaction to the variety." In the case of Geneva, "The thing that really sold it was the high test weight," he said.

The term test weight refers to the weight of the grain per unit volume. It is considered a measure of quality. Higher test weights indicate higher quality and a lower percentage of foreign substances, such as dirt or straw. Wheats which have high test weights, such as Geneva, go through the milling process quickly and easily, a feature very desirable to wheat millers.

In addition to the high test weight, Geneva has a higher yield than most wheats. And higher yields translate into higher profits for farmers, which is a top priority for government and researchers. The goal of his research is "to increase farmers' profits first and foremost," explained Sorrells.

"It is extremely important for New York

to maintain and improve its agricultural base," Sorrells contended. Although New York is not considered to be a major agricultural state, it still must compete in the same markets as more farm-oriented states, such as Illinois.

Wheat research is a highly specific field. "New York state crop varieties in general are bred for local conditions . . . and are adapted for this area," Sorrells explained. This allows for scientists to develop ideal crops for the particular environment they are focusing on.

In the case of Geneva wheat, the specificity truly shines through. According to the 1991 Cornell Recommends for Field Crops, "Geneva has superior yield . . . test weight, and virus resistance. It deserves its popularity with New York farmers." This guide is prepared by researchers at Cornell, and farmers across New York state trust its advice.

Geneva also possesses very good milling and baking characteristics. Geneva's low protein content allows it to produce a high quality flour. This flour is perfect for baking, as it produces fluffer doughnuts and lighter and bigger cookies. The flour is also useful for the baking of crackers, and the whole grain is used for shredded wheat.

Geneva has one flaw that is characteristic of all white wheat varieties currently grown. White-kernelled wheat has a tendency toward pre-harvest sprouting. This means it may sprout before harvest time, possibly while the seed is still on the stalks of the wheat plant.

However, Geneva is quite resistant to many diseases that often plague crops and vex farmers. For example, it is extremely resistant to wheat spindle streak mosaic virus, which can turn leaves yellow and weaken the entire plant. Geneva also has a slight susceptibility to common strains of leaf rust and powdery mildew, which may affect wheat plants.

"One thing not apparent to people not in the business is that it's difficult to find superior varieties," said Sorrells. Through the breeding technology used today, varieties are crossed in an attempt to create new and improved strains. And many crosses must be tried before success is found.

How do researchers decide which varieties to select for their combinations? "We select out different genotypes and begin
testing them,” Sorrells explained. They are tested for traits such as test weight, yield and maturity.

Then, the chosen varieties are crossed, resulting in gene segregation and variation for important traits. Once a superior combination of traits is found in a new selection, the seed is increased by the New York Seed Improvement Cooperative and sold to seed companies. Then the seed is cleaned, treated and put in bags. Eventually, it is made available to the farmers for purchase.

Perhaps the variety will catch on and become a favorite among farmers. However, varieties do not usually remain popular for more than a few seasons. “A variety’s popularity gradually tapers off,” said Sorrells. Then, new and improved varieties are introduced to the market, replacing out-dated strains.

At Cornell, Sorrells reported, work is being done to develop new wheat varieties resistant to pre-harvest sprouting, a particular problem in the northeast. Caused by humidity or rainfall at harvest time, the disease ruins the wheat crop, making it good only for livestock feed. Sorrells plans to release a new, more resistant, higher-yielding wheat variety in approximately three years.

In modern research technology, some new developments have been implemented. Nowadays, Sorrells reported, “Most food crops are being bred for more specific purposes, using genetics.” For instance, some oil crops are being grown to be lower in saturated fats.

In general, “Custom-made varieties are being bred specifically for certain purposes,” commented Sorrells. This is accomplished through molecular genetic research, a complicated procedure that uses molecular markers, a sort of genetic tag, to select for important traits.

Geneva wheat is just one example of the accomplishments of the Department of Plant Breeding at Cornell. Explained Sorrells, “Working toward agricultural progress is extremely important for the farmers of New York state.”

by Erica L. Fishlin '93
Teaching During the Revolution

HIDDEN IN A BASEMENT ROOM IN THE depths of Warren Hall on the College of Agriculture and Life Sciences campus is a technological treasure. This room houses the most sophisticated Macintosh microcomputing center at Cornell—the only Macintosh computer laboratory in the College. For communication students in particular, this lab has made a vital change in their course of study.

The Warren Hall lab is the only computer center on Cornell’s campus that is equipped with desktop publishing programs and hardware. With its opening came a revolution in teaching visual communication at Cornell.

Desktop publishing is widely defined as the practice of publishing on computer. Before the development of the Macintosh computer in the mid 1980s, the field did not even exist. But in the last seven years, computer technology has expanded so that publishing on the computer has taken over the communication industry.

Before then, the Department of Communication was teaching its students traditional methods of visual design. Tools for learning included tissue paper, light boards, T-squares, technical pencils and pica rulers. Computers had no business in visual communication classes. But with the foresight of a few professors, Cornell students soon entered the era of desktop publishing.

Around 1985, people in the College were starting to realize that the age of the Macintosh was at hand. One such person was Professor Clifford Scherer of the Department of Communication.

Scherer teaches Introduction to Visual Communication, a course that teaches basic design principles and introduces students to desktop publishing. Before Scherer’s arrival in 1985, no one in the College was teaching communication on computers. But Scherer began teaching his class in an IBM lab in Warren Hall.

In the beginning the technology was unsophisticated. Scherer only used computers as a supplementary tool for teaching visual communication. But, said “All rights reserved, The Metropolitan Museum of Art”
Scherer, "As it became obvious that computers were going to become more and more important in producing visuals," he began to move his curriculum away from traditional methods and into the world of desktop publishing.

At first this meant using Pagemaker, a full-service desktop publishing application, on the IBM computer. But Scherer was having problems with the available facilities. He explained that there were no laser printers and the machines were not fast enough for such a complex program.

Lecturer Marcelle Lapow Toor faced similar problems when she joined the Department of Communication in 1988. Toor teaches The Art of Publication, an upper level design course that concentrates on using desktop publishing for design. Although she was hired for her computer experience, she said there were no facilities to teach desktop publishing when she arrived at Cornell. She spent her first semester lecturing on design principles and helping students design basic visuals on the computer before she was able to find a Macintosh facility in which she could teach.

The establishment of the Macintosh lab on the College’s campus in 1990 profoundly affected teaching methods in the communication department. Both Toor and Scherer agree that the lab was the tool they needed to make their courses complete. Scherer said of desktop publishing, “It takes designing out of the realm of just artists. It gives people who don’t have the dexterity for drawing a straight line the ability to design.”

Scherer teaches his visual communication course very differently than he did in the 1980s. Back then it was essentially an art course. Today he spends a good deal of time discussing the basic principles of visual design. The rest of the time he spends teaching students how to apply those principles as they work designing on the computer.

Both Scherer and Toor are quick to point out that the computer is just a tool. They emphatically explain that understanding design basics is fundamental to producing communicative visuals.

Toor’s teaching methods have also changed with the arrival of the Macintosh lab. “The past three years have made an amazing difference,” said Toor. Today her students do all of their assignments on the computer. Each semester her class takes on projects for non-profit organizations and works as a “design firm” to come up with graphic solutions on the computer for their clients’ needs.

Toor is now able to spend more time critiquing her students’ work. The computer makes the designing go faster, she said. "The more students design, the more opportunity they have to improve." Toor explained, “The more students design, the better they get. I never got results like this from design majors.”

The demand for applied courses continues to grow, and Toor insists that students have to balance theory and applied courses in their curriculum if they are to have a well-rounded knowledge of visual communication. Scherer agreed, stressing the importance of understanding basic design.

Visual design courses are not the only part of the Department of Communication that has been affected by the computer age. Assistant Professor Geri Gay PhD ’85 teaches Interactive Multimedia: Research and Design, a communication course that focuses on theory and practice in the design of interactive multimedia for communication.

Taught out of the Interactive Multimedia Group’s privately funded facilities, Gay said her course provides students with an overview of the use of interactive multimedia technologies as communication tools. The course is taught through the communication department, but it attracts seniors and graduate students in engineering fields as well as social sciences. Most of her communication students come to the course with a strong background in either communication theory or graphic design.

“The future is what we’re working on,” said Gay of her students. Together the Interactive Multimedia Group and Gay’s students are working on the integration of text, graphics, and motion video so that computers can be used as a sort of “sight and sound encyclopedia,” explained Gay. She said that in the next five years computer prototypes like the ones her students are now developing will become commonplace in schools. Such computers are already being used in museums like the Smithsonian Institute in Washington, D.C. “It makes education a little more exciting,” she added.

“As this country is networked, computing and communications technology will
be fused. Communication issues will need to be resolved," said Gay. She suggested that students need to become more aware of what's happening in the world of communication technology, and that courses in understanding and interpreting information and in researching and visual literacy need to be a focus of Cornell's communication curriculum.

Computers have greatly changed the way we communicate. The Department of Communication is doing its best to see that its students are prepared to enter the "computerized" working world. Teaching visual communication on computers has been successful, according to Toor, pointing to the number of students who have graduated and moved on into the communication industry. "Our students are out there, and they are getting jobs based on the skills they learned in the communication classes," said Toor. "We're right on the cutting edge."  

by Monica E. Bernstein '93

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**In the Beginning . . .**

**THE IDEA OF CREATING A MACINTOSH computer laboratory on the College of Agriculture and Life Sciences' campus originated mainly from faculty suggestions.** Professor Lois Willett of the Department of Agricultural Economics, for example, had been using a Macintosh in her office and had expressed to the College the need for an up-to-date Macintosh lab on campus.

Similar suggestions came from Tom Hughes of Cornell Information Technologies (CIT) and Professor Clifford Scherer of the Department of Communication, said Florence Blodgett, who manages the computer labs in Warren Hall. According to Blodgett, a college-wide committee of several faculty members was established to discuss setting up a Macintosh lab.

In 1987 Blodgett drafted a proposal for a second IBM lab to be established in Warren Hall. This initial proposal was rejected for lack of funds, and it took another year for the possibility to come up again. Responding to faculty needs, Blodgett resubmitted the proposal, requesting a Macintosh facility instead of the originally proposed IBM lab. The proposal, which was submitted to Dr. George Connerman, Director of Instruction for the College of Agriculture and Life Sciences, was enthusiastically approved.

In the fall of 1990, with the help of the original committee, the long-desired Macintosh lab became a reality. The College now has some of the most sophisticated facilities on campus.

The new computers are equipped with a range of software. "Traditionally the policy of the College of Agriculture and Life Sciences has been to support one word processor, one spreadsheet, a database, and a statistics package" in its computer labs, Blodgett added. "For anything beyond that—a professor usually has to find departmental funds," she said. Though desktop publishing software is currently not part of the official support policy, it has quickly integrated itself into the ingredient list of the well-stocked computer lab.

The funding for these labs comes from the state. Recent budget cuts have not slowed progress on keeping the lab up-to-date with the rapidly changing technology, according to Blodgett. "Usually it's people that get cut, not equipment," she added. "We haven't suffered for new things." She reads computer industry trade publications and surveys the faculty in order to keep the facility up-to-date and to continue satisfying faculty and student needs.

The most recent upgrade in the lab was the switch from System 6 to System 7, which occurred over the summer. System 7 lets the computer perform more functions simultaneously, such as allowing more than one application to remain opened on the screen at a time. It is also better for educational purposes, said Blodgett, as it has an intricate "help" system that System 6 lacks.

Currently the Macintosh lab is equipped with 25 MacII CX's that have 40 megabyte hard drives, one black and white scanner (a machine that allows you to transfer a visual from paper directly into the computer), two laser printers, and five Imagewriters. While the Imagewriters will print free of charge, the laser printers charge 15 cents a copy.

The amount of money that comes in on the laser printers proves to be larger than originally anticipated. The money received will pay for the machines within two years of their purchase.

The facility is currently used as a teaching lab for three education classes, three agricultural economics classes and three communication classes. Lab technicians—most of whom are undergraduate work study students—are hired to assist users and to facilitate the operation.

The popularity of the Macintosh lab is increasing rapidly as more students find out about it, said Blodgett. "I tell our students not to tell anyone about the lab . . . We like it quiet!"
Moving to the Top

Dr. Douglas C. Knipple, an insect molecular biologist in the entomology department at the New York State Agricultural Experiment Station, was made an associate professor. Knipple, who has been at the Geneva station since 1985, focuses his work on applying techniques of molecular biology and genetics to problems relating to controlling insects.

Dr. Michael G. Villani, a soil insect ecologist in the Geneva entomology department, was also promoted to associate professor. Villani’s main area of study is the biology and control of insects that reside in the soil and attack plants.

Enjoying the Rain

In February 1989, the state’s Office of Rural Affairs established the Rural Assistance Information Network (RAIN). This free computer service recently received its 10,000th call from a client.

The RAIN system is a computerized catalog of more than 1,500 technical and financial assistance programs offered by the state and federal governments. These programs include grants, low interest loans and other services including economic development, transportation, social services, and science and technology. The service also offers a bulletin board of current rural news.

Potential users can become involved by sending messages via modem to the RAIN computer located in Albany.

Center Evaluates Impact of New Research

The Cornell International Institute for Food, Agriculture and Development held a conference in June 1991 to assess the impact of research on raising the standard of living.

“Sustainability” is an important issue to research because it is a prime criterion for evaluating whether a particular research focus will really improve agricultural productivity or the economic health of a community or region. The center conducts research on new plant materials and develops new crop varieties to improve agricultural productivity in various ecosystems worldwide.

Conferees looked at factors such as the number of farmers who have adopted the new technology or variety, how the product or technology affects costs, productivity and income for farmers; price effects for consumers; consequences for soil, water and biotic resources; and how the research ultimately helps in reducing malnutrition and rural poverty.

Environmental Center to Offer Solutions

To find answers to environmental problems, scientists need to adopt a multidisciplinary approach. Cornell’s new Center for the Environment will draw professors from various departments and tap into the expertise of visiting experts. Former Senior Provost Robert Barker, who directs the new center, will coordinate activities among 200 faculty members.

Research at the Center will not only look at biological principles, but also social and political factors. Barker will also try to raise $40 million for the Center as a part of the University’s $1.25 billion fundraising campaign.

Developing with a New Director

Rebecca Smith has been named director of development for the College, assuming the position in July 1991. As director, she will be responsible for the College’s capital campaign, which has a five-year goal of $95 million.

Smith comes to the College from Cornell’s central development office, where she was associate director of principal gifts.

Smith replaces Lael Carter, who is now associate director of major gifts for Cornell.

Honoring Alumni

The 1991 CALS Alumni Awards Banquet was held Friday, November 15, at the Statler Hotel Ballroom at Cornell. This year’s ceremonies honor four outstanding alumni as well as the 1991 Young Alumni Achievement Award winner, who is Denise Patricia Meredith ’73.

The hosts of the evening are Marian Rippy ’79, who is the newly elected president of the College’s alumni association, and Elaine Newcomb ’64, chairperson of the awards committee.

Since the creation of these awards, 54 of the College’s 37,000 alumni have been awarded. The late Joseph King ’36 was the first recipient in 1977.

Honored this year: Robert C. Baker ’43 is Cornell professor emeritus of food science, and inventor of more than 52 poultry meat and egg products and 28 fish and seafood products, and a consultant worldwide on poultry and seafood products and marketing.

Alfred D. Longhouse ’37, MS ’38, PhD ’47 is professor emeritus and former chair of the Department of Agricultural Engineering at West Virginia University, a noted educator and establisher of research and extension programs in agricultural engineering.

Judith Riehlman ’80 is County Clerk in Cortland, N. Y., a civic and political leader and partner in a 600-acre family dairy farm.

Fenton B. Sands ’43, MS ’53, PhD ’54 is a leader in agricultural development and world food problems who has worked abroad with World Bank and the Ford Foundation.

Steve Smith’35 a retired teacher of vocational agriculture and high school principal, has served as consultant on vocational agriculture for the New York State Education Department.
About the Issue

At 125 years-young, the University celebrates. The Countryman examines issues affecting the College at this watershed by looking at the evolving mission of the College as a land grant institution and the College’s campaign for endowment. Relevant to the University’s anniversary are alumni issues. Our coverage includes the ALS Alumni Association, legacies, and the Cornell Tradition Scholarships. Also, the timeless topic of winter on the hill receives a light-hearted review.

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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, sexual preference, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.
Big Red in the White

WINTER IN ITHACA.

The very phrase conjures up a myriad of images: students walking to class bundled up in layers upon layers of clothing; waking up on bleak winter mornings and looking out your window to find a bank of snow staring back at you; sliding down Libe Slope on a dining tray at breakneck speeds; watching your frosted breath linger in the cold morning air; snowball fights on the arts quad; and, for a few privileged folk, ice skating on Beebe Lake and sliding down toboggan slide.

Sometimes it seems as if Ezra Cornell had specifically designed the Cornell campus to be a veritable winter haven for snow-filled fun. Then again, it often seems that the Cornell administration has cleverly schemed to eliminate all these daring winter activities.

For example, traying down Libe Slope is forbidden. “Tray-riding was very big back then,” said Gary Weissbrot ’91, who studied at Cornell from 1967 to 1969. “You didn’t just steal a tray from the dining hall, you personalized it. You painted and decorated them. Peace signs and paisley were very big back then.”

Just as traying is prohibited by university policy now, it was also condemned during the 1960s. However, the administration of two decades ago seems to have been more sympathetic to the mischievous child inside each student. Weissbrot explained that “The University lined the trees with hay and set up bales at the bottom of the slope, so people wouldn’t get hurt.”

Some students, however, agree with Cornell’s decision to ban traying. “I’m afraid to go traying,” admitted Jenn Nolte.

A Cornellian crosses the suspension bridge over Fall Creek gorge.
"I knew someone who broke their shoulder blade sledding when I was a kid, and I don't want to do that."

Yet another casualty in Cornell's calculated attempt to make winters safe is ice skating. Half a century ago, when winter came, so too came the crowds. Throughout the season, Cornellians flocked to Beebe Lake, ice skates in hand. Now, skaters are no longer welcome to glide across Beebe Lake's icy surface.

Also missing is the old toboggan slide that once dominated the south shore of Beebe Lake during the winter. Gone are the intrepid souls who stood in line at Toboggan Lodge, awaiting their chance to hurtle rapidly down the slide and shoot off across the lake's mirrored surface.

Of course there has been some token compensation. Lynah Rink has since been introduced as the alternative skating rink, though it is smaller, more sterile, more bland and perhaps worst of all, indoors.

One of the only remnants of winters past lies in the hills behind North Campus and in the slopes in the Plantations. People are still allowed to slide on them today.

Nevertheless, one can't help but feel that in losing all these romantic traditions, Cornell has also lost some of its winter charm.

Before the construction of Lynah Rink in 1957, the Big Red hockey teams ventured to play on the natural ice of Beebe Lake. Of course, due to unpredictable weather conditions, very few games were actually played, but the mystique of the frozen lake lent a certain rag-tag, underdog charm to the hockey team that has since been missing from Lynah's sterile confines.

Two seasons actually went by with nary a game played, the invoked image of skaters making their way across Beebe Lake in a real outdoor hockey game elicits a sentimental yearning for a simpler past.

Ithaca's climate, however, may not be as simple as its past. The source of a heated debate, Ithaca's winter conditions provoke strong responses from many people—those who enjoy the cold months, and those who can't stand to bear the extreme temperatures.

Warren Knapp, Associate Professor of Atmospheric Science and Director of the Northeast Regional Climate Center, arrived in Ithaca from Wisconsin in 1969. He maintains that the "winters in Ithaca are considerably milder," adding that, "I finally threw out a winter coat I had in Wisconsin recently because it was too heavy for Ithaca."

Carla Shafer '91 is another undaunted by Ithaca's reputation as a wintry wasteland. "You know, I'm really starting to like them," Shafer claims, "I'm from California and I just had to get used to them. My first winter was very hard because I didn't know what to expect. But now I know what it's like and it's really not so hard."

Weissbrot echoes Shafer's sentiments, "It seems to me, quite honestly, to be much milder," pointing to one example as evidence of a kinder, gentler winter. "There used to be a huge ice ball at the bottom of Taughannock Falls during the winter months. It's not there anymore because it's not cold enough."

Not cold enough? Many voices beg to differ. Nolte had this to say about Ithaca winters: "It sucks. There's nothing to do. It's too hilly. You slide and fall on your butt."

Michelle Sack '93 describes the winter months as "cold torture. It's like biting into a York Peppermint Patty." She pauses to reconsider her statement. "Well, it's actually more like freezing your face off."

Stacey Dejonge '94 concurs enthusiastically. "It's freezing hell," she laughs. "It's a nightmare."

When asked if she derived any pleasure from the long winter months, Dejonge replied, "It makes you appreciate the sun a whole lot more. Those few days that we actually get sunlight, I bundle up under forty layers of clothing so I can go out and enjoy the sunshine."

Confronted with the same question, Nolte answers rather sheepishly. "You
dream of what you could be doing spring break."

Still, there must be more brave souls out there who aren’t so intimidated by cold weather. What about the global warming trend which threatens to raise temperatures to the point of melting the earth’s polar ice caps?

In an attempt to explain this phenomenon and its effects on Ithaca, Knapp contends that “There’s just too much variation from one year to another to document winter trends.” In fact, Knapp goes so far as to say that there is no discernible difference between his first Ithaca winter in 1969 and his last winter in 1990.

“The greenhouse effect,” agrees Weissbrodt, “in this number of years, is insignificant.”

Nevertheless, Knapp points out two notably cold exceptions. One is readily illustrated by the *Ithaca Journal’s* January 18, 1978 headline, “15 inches buries Ithaca! Forecast sees another storm.” This proclamation announced Ithaca’s largest snowstorm in recent history.

A second deviation lies buried in the brutal winter of 1989, which, according to Knapp, produced the coldest December in the history of Ithaca, since documentation began in 1879.

Despite the bitter cold, the shrinking number of opportunities for daring ice escapades, and the long, bleak chilly months, winter in Ithaca can still be an experience to be enjoyed and appreciated. The number of people who enjoy traying, skiing, ice skating, and snowball fights don’t seem to be fazed by the cold at all.

“I don’t think it’s so bad,” maintains Mike Zeliger ’92, “It’s not the cold that bothers me so much, but the dampness. It’s like it snows a little bit every day.”

For those who savor the winter months, it does.

by Allan Wai ’93
A LOT OF THINGS CHANGE IN 125 years—especially at Cornell University. Old buildings are torn down and new ones tower in their place. Methods of teaching are enhanced to offer more interaction between students and faculty. The student body is made up of greater percentages of women and minorities. Funding from the state and federal governments continues to decrease. But most importantly, the University is treating its alumni with greater respect.

When more than 2,000 alumni from all over the world met in San Francisco for four days in mid-October 1991 to celebrate the university's 125th birthday, they not only had a chance to rejoice and recall cherished memories with old friends, they also learned about the problems that currently plague Cornell and its students.

Besides fun-filled events like a cruise around San Francisco Bay, the University offered various educational activities to the alumni. The largest, and most vital, event of this nature was a luncheon, which was broadcast on National Public Radio, where Cornell President Frank H.T. Rhodes, Stanford President Donald Kennedy and Berkeley Chancellor Chang-Lin Tien spoke on the challenges that face undergraduate research institutions.

"With an economy in a recession and a reluctance by the government to offer extra funding, financial aid is at risk," said Kennedy. Rhodes chimed in by saying that the same two factors will prevent research universities from fulfilling their mission of training students to be tomorrow's leaders. "Stanford, Cornell and U. Cal. are facing the toughest of imaginable times. Cornell is facing a harsher period in the next five years than in the last 125 years. How are we to face this period?" Rhodes asked.

While all three presidents said that the government should reallocate military spending into education funds now that the Cold War has ended, they offered an immediate solution to the problems. They spoke of better educating their alumni on the hardships challenging today's universities and hoped that they will help their alma maters in these desperate times.

"Our choice is clear. Either we pull together, drawing on our collective strengths to move forward, or we remain entrenched, weakening our choices of meeting educational challenges," Tien said.

Kenneth Blanchard '61, who graduated from the College of Arts and Sciences, said these presidents were trying to mobilize alumni support. "This isn't the rah-rah speech they usually give us."

One agriculture alumna, who requested anonymity, said, "I have felt used. Cornell would call me up, ask me to remember the glory days, and ask for a check for $5,000. That's not fair. Now that they are telling me that I can make a difference between a student getting financial aid or not, I want to donate $5,000. They should appeal to our intelligence, and give us respect, instead of condescending to us."

In fact, most of the weekend strayed from the usual pep speech that alumni are used to. Many alumni said that for the first time, the University is genuinely trying to inform them of its actual problems.

David Call '54, dean of the College of Agriculture and Life Sciences, said, "The College is not trying to outright fund-raise, but friend-raise." He explained that by telling alumni about financial aid cuts, non-competitive salaries for faculty and budget shortfalls, they will see where the University really needs help and become true friends to the University.
In the past, alumni were told how great the University was, what rank it held in U.S. News and World Report and how well the football team was doing. Then alumni would offer donations to specific programs that they were affiliated with during the good ol' days. Some alumni said that they gave money to the glee club because they once sang with the Cayuga Waiters. Others said they gave funding to the Plantations because they helped to beautify them when they were students.

"But getting alumni funding for non-specific programs such as financial aid has always been difficult," according to Richard Ramin, Cornell's vice president for public affairs, who has been coordinating the University's five year $1.25 billion fundraising drive.

Ann McCann, director of student aid development for the fundraising effort, said, "We're lagging somewhat behind schedule." Rhodes said that he thinks that alumni donations toward general programs like financial aid will increase if administrators offer better recognition to donors.

Several University officials explained that alumni like to give money to programs where their names will be associated with the donation, such as the John Smith Center for the Arts, or the John Smith Fellowship for Engineering Excellence.

But many alumni said that now they know more about what the University needs, they will change the target of their donations. "Now I will give money to financial aid; it doesn't have to be a specific group or program anymore," said Helen Harding Clark '36, a graduate of the arts college.

She added that she resented the University's rah-rah approaches. "I like to know the facts, I don't like to be kidded around," she said. Agreeing with her comments, Sarah Hurlbut '80, an alumnae of the agriculture college, said "This is the first time that agriculture alumni are really noticing the real problems that exist."

Some alumni said that they wish to know even more about Cornell's headaches. "I would like to know more of the details so that I can really help. From now on, I'm giving my funds to the ag school's general budget so that they can free up funds for other programs that need aid," said Tom Clark '63 an agriculture alumnus.

William Boldt, an assistant dean in the agriculture college, said that the school has spent the last five years trying to better educate its alumni. "Alumni enjoy learning about the colleges and the numbers prove it. Five years ago we had 2,000 active alumni in our association, now we have 6,000. I guess education does not stop with the degree." Another University official said that the new approach to alumni fully kicked in when the fundraising campaign began a year ago.

Aid from alumni, however, does not always have to take the form of a check. Alumni can help organize events, train students and faculty and advise the University in long-term planning, according to Jane Longley-Cook '69, a graduate of the agriculture college. "Even though many alumni cannot afford to contribute economically, they can now contribute in other efforts," she added.

"The diversity in the student body is reflected in the alumni body. This diversity of interests and specialties can help the University in many ways," added Carolyn Neuman '64, a graduate of the College of Human Ecology.

The alumni diversity will help to perpetuate a tradition of diversity within future student bodies. Financial aid funds, among other general purpose programs, will hopefully grow with the rekindled spirit among alumni.

After all, Rhodes said, "Cornell's alumni are second to none, and that's one thing that hasn't changed during the last 125 years."
Admissions:
Is it all relative?

WHAT WAS IT THAT GOT THEM INTO
the freshman class? Was it her high SAT
scores that got her in? Was it his exceptional grades on his high school transcript? Was it the fact that she was an officer of almost every club and organization during high school?

Or, was it the fact that both of their parents attended Cornell?

According to how the College of Agriculture and Life Sciences treats its children and lineal relatives of Cornell alumni, or legacies, academic standing is more important during the admissions process than their parents’ alma mater.

Figures show that legacies in the ag school have about a 10 percent greater chance of getting accepted than non-legacies. Administrators agree that there are advantages to accepting alumni children, indicating that they do have a slight edge in the admissions process. Despite this, admissions officers maintain that Cornell takes a firm stand in not sacrificing the quality of its student body.

“I think that it’s clear that Cornell, along with all the universities, pays attention to their legacy children and admits those that are competitive,” said Richard Church ’64, coordinator of admissions in the College of Agriculture and Life Sciences.

In the ag school’s class of 1995, 44.6 percent of the legacies that applied were accepted while the general acceptance rate was about 30 percent.

Dean of Admissions and Financial Aid Susan Murphy agreed that the numbers do show a slight advantage for children of alumni but added that legacies are never accepted if they do not match up to Cornell’s standards.

“We’re not going to bring somebody here only because of who mom and dad are, and that to me is one of the challenges for alumni children to believe is that they’re here because of who they are, not because of who their parents are,” said Murphy.

The Cornell Viewbook, which is given to prospective students and contains part of the application, prepares interested students for the slight preference for legacies. The book informs students that being an alumni child is taken very seriously and when deciding between applicants who are about equal in qualifications, legacies may be favored.

“What happens in a selective admissions process is that there are going to be some qualified students to whom you have to say no and we try to look at our alumni children with a special care to have that not happen as often as possible,” said Murphy.

According to Church, one of the reasons legacies are taken seriously is because of tradition. “Cornell and I think the College of Agriculture similarly have a lot of families that have had a tradition of having family members come to Cornell,” said Church.

“Any school that’s as old as Cornell relies a lot on tradition. Anytime you have somebody who has attended the University there’s an emotional attachment. I think that a lot of it is long-term and a familial generation tie to the University doesn’t just mean financial contribution, but it means a carrying on of history,” said Liz Giles ’86, assistant director of alumni affairs.

Church said that another reason legacies are wanted at Cornell is because of the financial contribution that the parents will give, but that it is not too important for the ag college as it is state-assisted.

“Families that have a lot of Cornellians are often good supporters of the University. I don’t think that’s a key factor for the College of Agriculture and Life Sciences. I think it’s more of an alumni support network,” said Church.

Church explained that as more members of Cornell families are accepted, the alumni network becomes tighter and more powerful.

“I think that where you can accept somebody that’s part of a family you generate a little more alumni and family enthusiasm for Cornell. As long as they’re competitive and appropriate, it’s a plus where we can add to families that are already Cornellians,” said Church.

Murphy agreed that both financial and volunteer support from alumni can be factors in the legacies’ acceptance.

“For those people [alumni] who have given generously of their financial support and generously of their time may cause us to look at that son or daughter with a special eye,” said Murphy. “It’s not going to be the reason why the answer is yes, but it’s probably going to result in a second or third reading of the folder that might not come with the others. More often than not, second or third readings are to the student’s benefit.”
Giles explained that another reason legacies receive a slight edge is because they are usually a smart group of applicants. "Students that are legacies tend to be generally outstanding students. What you find is that legacies tend to be outstanding applicants because there's probably been a large stress on education throughout their formative years. Their parents obviously were well-educated and therefore there's a stress on that," said Giles.

Murphy said a factor in why legacies are welcomed is because of the closeness of the Cornell community. "Alumni are members of our family. Our alumni children are our family and we try to treat the family a little bit differently than we may treat others," said Murphy.

Murphy also added that "as an applicant group, they're an interesting group of people. The students themselves bring a richness to the campus."

Along the same lines, Giles said a reason legacies are given careful consideration is because it serves as a way of giving something back to those alumni that are supportive.

"It's just a service. A lot of times we ask alumni to volunteer a lot, for university council, board of trustees, planning reunions... We want to be able to provide a service to alumni," said Giles.

Another reason why the College of Agriculture and Life Sciences welcomes legacies is because it is a way of fulfilling the original purpose of Cornell's mission to help rural families settle.

Church said that there are many appropriate students who are members of farm families and the ag college welcomes them because they seek more students in that area. "It's sort of a double benefit to get an appropriate agricultural-interest student who is also the member of a legacy family," said Church.

Murphy agreed that by accepting alumni children in farm families, the ag college is serving its mission through education. "We have a commitment as a land grant university to serve the people of New York state. A major way of doing that is through our extension efforts and research. But I think it's also to provide educational opportunities to the people of the state. If we've had a parent here because of the farm connection, it does keep a pipeline," said Murphy.

Vincent Phelps '94, is an example of how the ag college can help to serve its mission through continuing the Cornell
tradition in families. Phelps, who lives on a farm, is a fourth generation Cornellian and has had at least six relatives attend Cornell.

"As a prefrosh I knew more stories than the people giving the tours," said Phelps, whose father, uncle, grandfather, grandmother, great-grandfather and great-aunt all attended Cornell. Phelps said that he found it a relief to know that he was not alone in his efforts to learn about Cornell.

"It was sort of expected of me almost," said Phelps, who as a legacy, represents about 12 percent of his class.

Although Church said that these are factors which make alumni children an attractive group of applicants, nothing was done differently with the 107 legacies that were accepted out of the pool of 3,475 college applicants during the admissions process last year.

Murphy explained how legacies and other special interest groups are treated during the admissions process: "I think what we do for alumni children, and it's not unique to alumni children—we'll do it for farm kids, underpopulated majors and under-represented ethnic groups—is to look at the personal qualities of accomplishment and motivation and potential as we look at the already demonstrated performance and particularly standardized test scores. That balance may not be as even with a non-legacy, a non-farm kid, a non-under-represented minority," said Murphy.

The slight edge may also come from the fact that the legacies' introduction to Cornell starts early on. Giles is the head of a campus-wide program designed to give alumni children an early introduction to Cornell by maintaining contact with them from the time they are in eighth or ninth grade.

Giles sends general information about the college search and career options to children of alumni from about eighth grade to sophomore year and then during the junior year, she starts sending out materials specifically about Cornell.

Although Giles does not play any role in the selection process, she monitors the legacies' progress through the admissions cycle and answers any questions they may have.

"My goal is to give them enough information so that their presentation of their application is as strong as it can possibly be," said Giles.

Although Giles said that the legacies' applications go through the same grind as everyone else's, if an alumni child is rejected, he or she will receive a special letter from the undergraduate office and the director of admissions informing the applicant that their credentials and Cornell connection were considered seriously.

Giles said that an advantage of the program is that children of alumni are able to weed themselves out of the pool more quickly than other students.

"Students who maybe are not academically qualified to come to Cornell will self-select themselves out of the process and not apply," said Giles.

But if they do apply, children whose family trees are covered with Cornell degrees can expect to be given a very careful examination by the admissions staff. Murphy stresses that the legacies must also stand strong on their own, despite the family connection: "While we are delighted to be able to continue the family tradition and that's an important piece of the admissions process and of Cornell's history, it's not at the expense of quality."*

* by Leslie J. Gross '92

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Grandfather & Grandmother Phelps' marriage at Willard Straight Hall 6-29-40

Phelps' family reunion
ITH THE ECONOMY IN A RECESSION, THE JOB MARKET can seem more impenetrable than ever. But now job-hunting students and alumni have a new resource to help them in their job search: SUNY Search, an electronic candidate referral service recently developed by SUNY (State University of New York) career development employees.

"It's unique, it's creative, it's on the cutting edge," commented Bill Alberta MS '77, coordinator of the Career Development Office in the College of Agriculture and Life Sciences. "There's nothing else like it in the country."

SUNY Search is a computer database of information about SUNY seniors, graduate students and alumni looking for employment. At no charge to the students, the computer stores information about them, such as major, degrees, career interest and geographic preference, in three databases (local, state and national).

Once the student information has been compiled, potential employers, both public and private, can request searches of the local, state and/or national databases for candidates who meet certain qualifications. For a modest fee, the computer will generate a list of job seekers who fulfill the desired criteria. Alberta is delighted with the potential of SUNY Search. "It's a big frustration helping students connect with employers," he explained. "There are eight million employers in this country, but only the large companies can afford to come to campus. Yet the mid-size and small companies do the lion's share of the hiring. With this new database, they don't have to come to campus."

The project was initiated three years ago by the SUNY Career Development Organization (CDO), a professional association of SUNY career services employees. One committee of the CDO headed the effort to create a system to cooperatively market the graduates of the 64 SUNY colleges. Said Stephanie Zuckerman, co-chair of the committee and director of the Career Development Center of SUNY College at Buffalo, "We realized that by marketing SUNY students together rather than separately, we could work together to be more efficient with our tight budgets." And so emerged SUNY Search, which officially began in September 1991.

"It's an incredible concept," Alberta said. "Marketing students to employers has always been our biggest challenge. Now we can better facilitate the connection between employers and students seeking work. It's another mechanism for finding jobs."

Zuckerman agreed, "It's an opportunity to assist students in the job search. It's one more thing we can do to expose graduates to as many employers as possible. We can provide a service to both SUNY graduates and employers."

Twenty-three of the 64 SUNY colleges are participating in this first year of SUNY Search. "Just like any new project, it's been trying for the past few weeks," admitted Zuckerman. "But now that it's off the ground and running, we're very excited about it."

Students are excited about the project, too. Their response has been overwhelming, according to Zuckerman. "The students on my campus are so positive about it," she said. "Because of the tight job market, the timing couldn't be better."

It's difficult to tell how many students have already enrolled, she said, because the project began so recently. But, she added, "We're inundated here... and we're hoping for a total of 7,500 to 10,000 students."

At Cornell, student response has been more gradual. "There are only about 20 students in the database right now," said Sue Irvine, an office assistant in the College's Career Development Office. Irvine, who serves as computer expert for the office, said the delay may be due to a few computer problems that have since been resolved.

Amy Benedict Martin, associate coordinator of the College's Career Development Office, agreed that student reaction has been slow. She said students should realize, "Although [SUNY Search] won't be helpful to them until the spring, it's important to have their information as soon as possible, so we can market the database to employers. The marketing depends on the information we have. Hopefully more students will decide to take advantage of it; it's a wonderful resource."

Bruce Levine '92, who has already signed up for the database, agrees that SUNY Search is a good idea. "It's a way of getting in touch with small and medium-sized companies which I wouldn't otherwise have the opportunity to see," he said. "I hope it works. I can't come back for a fifth year, so I'm praying for the best."

Thanks to SUNY Search, the job search has entered the computer age. "We're using computers in a positive way," proclaimed Zuckerman. State-of-the-art technology is now playing matchmaker.

by Debra G. Birnbaum '92
MISSION:

"IT IS EXACTLY THE SAME AS IT WAS 125 years ago, except it has changed completely."

How is this possible?

According to Kenneth E. Wing ’58 MEd ’60 PhD ’66, Associate Dean of the College of Agriculture and Life Sciences, the mission of the ag college has undergone many changes throughout the last century and a quarter, while remaining true to its original intention.

The Morrill Land Grant Act of 1862 spurred the creation of a system of people's colleges in every state. Funds were provided specifically for the purpose of establishing colleges which offered education in the fields of agriculture and mechanical arts.

Gould Colman '51 MA '53 PhD '62, University Archivist and author of Education and Agriculture, A History of the New York State College of Agriculture at Cornell University, explains, "The idea [of the Morrill Act] was to use the money derived from the sale of federal land to establish at least one university which would provide military training and instruction in engineering and agriculture." Through these funds, and with this purpose in mind, the College of Agriculture was born.

In 1888, the trustees at Cornell united the departments of agriculture, veterinary science, agricultural chemistry, botany, entomology, and horticulture into the College of Agriculture. Since then, expansion and modernization have developed the ag college into the institution we know today, still offering instruction in subjects the original founders hoped to stress.

Now, according to Colman, "What constitutes agricultural education has been divided and specified." Features of an agricultural education are no longer restricted to just planting and harvesting. Instead, it encompasses a huge base of information on any and every conceivable aspect of agriculture.

According to Dean Wing, there are four F's of agriculture: Food, Fiber, Fuel and Fun. These translate into producing all
types of products, keeping farmers in business and doing it all with enthusiasm and joy. As long as the four F's remain in mind, agricultural education won't stray too far from its purpose.

Dean Wing explained that the original intention of the land grant universities focused on meeting the needs of rural people. This meant conveying to farmers the knowledge they needed to do their jobs. Now, "It's much more than that. We're meeting the needs of those involved in farming and those involved in consumption."

That touches upon the needs of an enormous population. As simply stated by Dean Wing, "Everyone is involved in agriculture because we all eat." The audience has broadened. And the College strives to meet the challenge of serving everyone who would benefit from its wealth of knowledge.

In this country, producers account for one percent of the population while consumers make up the other 99 percent. According to Dean Wing, "We brag about efficiency." We marvel at how this one percent of producers can support the rest of the population. But, Dean Wing says, what we really should recognize that it now takes 99 consumers to support one producer.

"We have an obligation to educate those 99 percent. These are the people who will: number one, eat and number two, vote. We have to do a lot more to educate that 99 percent because they want good products, products that look good, taste good and are good for them."

According to Wing, "You, as an educated consumer, need to know just as much about agriculture as a farmer, but what you need to know is the consumer side, . . ." About ten percent of students are in this College because they are planning to go into production agriculture in some form. But every student belongs here because they all leave as educated consumers." In other words, the education the ag college offers would be a valuable resource to a huge variety of potential careers and experiences.

The ag college has stuck to its original mission of education in the field of agriculture. However, its base has broadened to include every aspect of the industry.

"The mission of the land grant universities is just as important today as it was 125 years ago," Dean Wing said. "Although science has always been the primary focus of a land grant university, the kind of science is different."

Scientific research, always a top priority at Cornell, has led to great developments and changes in agriculture. Radical innovations have changed the way science is practiced today. These innovations have allowed the college to further its studies and expand into fields that may not immediately appear to be agriculturally related, but play an integral part in the system. These developments are what Dean Wing calls, "science-fiction agriculture."

Science-fiction agriculture deals with matters such as transgenic plants and animals or biolistics; terms that cover many of the radical new concepts that are taking science by storm. Dean Wing said, "Science-fiction agriculture is an era of agriculture that has already begun and is going to be mind-boggling."

As researchers come out with new and innovative concepts, Dean Wing said, "We always assumed anything we did was 'apple pie.' That is, it was good and desirable." But not every scientific discovery is greeted with open arms; without appropriate publicity and marketing, the agricultural industry could not survive, as it would face episodes of strong consumer resistance. In the past, Dean Wing explained, the industry has made some mistakes.

For example, "What are antibiotics?" Dean Wing asked. They are germicides, or germ killers. But the medical profession realized why "germ killer" would not be an acceptable name for their discovery; any product bearing a name with such a negative and frightening connotation could be ill-received by the public. The term "antibiotic" was far more acceptable.

So, Dean Wing now asks, "Why have we called pesticides, 'pesticides? Why not 'plant protectants'?" How would they be viewed today had the name been different, more innocuous? There has been so much misunderstanding in the agricultural business, Dean Wing said, "because we have not paid adequate attention to our communication."

This is how all aspects of the College, such as the wide variety of majors offered, really do work together for the industry. They all play vital roles in the improvement or maintenance or promotion of agriculture.

This is where the purpose behind all of the seemingly vast differences of the ag college springs to life. Wing said, "Communication and nutrition and consumption and health and everything else is just as important as how to plant corn."

The ag college has modern science, an enlightened population, new medical knowledge, and an expanding world population to work with. There are new challenges to be explored and met.

As for the mission of the College of Agriculture and Life Sciences, Dean Wing explained. "We've changed radically, and yet, we're the same as we were 125 years ago, serving the needs of society. But society, and science, have changed, and that's what makes it exciting."

by Erica L. Fishlin '93
How the Ivy Grows

ASKING FOR MONEY HAS BEEN EASY for Dr. Bill Boldt, Assistant Dean of Public Affairs for the College of Agriculture and Life Sciences. “The response from ag alumni has been overwhelming,” he said.

Boldt raises money for the College’s ‘We Grow the Ivy’ campaign. As part of the University’s $1.25 billion fundraising effort, Boldt hopes to reach the College goal of raising more than $100 million by December 1995. Dr. George Conneman ’52, Director of Academic Programs, said that alumni have always been more than generous.

“About 57 percent of our goal has been raised so far. We are doing well,” Boldt said. The campaign was announced about a year ago in October 1990 but funds have been raised for about two years. Almost four years are left to meet the goal which makes Boldt optimistic for the success of the campaign. “Even in these times of recession alumni want to give. They volunteer because they see we are in need,” he said. Many alumni developed professional networks while at Cornell. Boldt said that many alumni want to repay Cornell for their education outside of the classroom.

To keep alumni up to date on the needs of the College at least 30 gatherings a year are held with a Dean or faculty member speaking. “Alumni see how relevant our current curriculum is and help us keep up with the times,” Boldt said.

The feelings towards alma mater at Cornell are exceptionally high according to Boldt. Having earned his degrees elsewhere, Boldt said that he had not experienced the sense of tradition and loyalty one gets at Cornell. As evidence, Boldt submits that just last year Cornell exceeded Harvard and Stanford for the number of individual donors for the first time to become number one in the nation.

“This is the first major fund-raising campaign the College of Agriculture and Life Sciences has been involved in,” said Boldt, ironically. He calls the fund-raising campaign to maintain excellence. According to Boldt, Cornell has had the number one rated college of agriculture in the country but is faced with changing sources of funding.

“We are saying that we are no longer a state-supported college but a state-assisted college,” said Boldt. At the beginning of the seventies the College relied on the state for approximately 60 percent of its funds. Currently the state supplies about 37 percent of the College’s budget. Boldt said that the best-case scenario for the future is stable funding at the present level from the state.

With dire hopes for state funding, the College plans to counter the losses with the current campaign. Conneman breaks the campaign into four areas: innovative teaching programs, endowed professorships, student financial aid and a Center for the Environment.

In the vein of teaching, supporting graduate students with endowed fellowships will help maintain quality at Cornell. Providing funds for graduate students for the purpose of teaching and research is the top priority of the campaign, said Boldt. Graduate students provide much of Cornell’s teaching assistance. Full and partial scholarship endowments for graduate students make up $13 million of the College’s campaign. Boldt added that these endowments will provide a stable source of funding to guard against further drops in state or federal funding of the College.

Almost $34 million of the campaign goes to program enhancement which includes funds for departmental use and establishment of a Center for the Environment. The former Senior Provost, Robert Barker, directs the new center. Potential locations for the center include Rice Hall or other poultry buildings. Extensive renovations may be necessary before the use of these buildings, though. The center’s
purpose is to provide a cohesive pro-
gram for environmental studies. Boldt
said that interdepartmental courses would
be offered through the center.

The campaign has a $19 million goal
for endowed professor-
ships. Conneman said
that the en-
dowed professor-
ships will not only
free up money that
would add prestige
and attract toquality
faculty.

An undergraduate
student endowment
of $13 million would
be put towards three
kinds of scholar-
ships. Two are Uni-
versity scholarships
called the Ezra
Cornell scholarship
and the Cornell Tra-
dition scholarship.
The third is the
Scholarship Fund
specifically targeted
for the College. As
in the past, awards
will be need-based.

Endowments are
set aside for the li-
braries and facilities.
The library plans to
endow some posi-
tions and create a
book fund. Plans for
the library include
upgrading electronic
systems of access
and preserving rare
and endangered ar-
chival material.
Money for facilities
would be put to-
wards renovation of
older buildings.

The University-
wide effort also goes
by the label of a
friend-raising cam-
paign'. Boldt said
that the College wants to develop long-
term relationships with alumni. Pamphlets
keep many alumni informed of the
College’s goals and programs.

Corporations are expected to donate
about 40 percent of the funds for the
research findings said Boldt. Some of the
money is being directed to the Center for
the Environment, too. “Many corpora-
tions have reaped profits from the globe
and want to give back,” said Boldt. He
added that some will be able to make
money by healing damaged environ-
ments, too.

Faculty of the College are donating as
well. A goal of $5 million has been set, of
which $2 million has been committed. Of
the emeritus faculty, 19 serve as solicitors
of their 236 col-
leagues. Boldt said
that the College was
the only one at
Cornell with a col-
lege-wide fund-rais-
ing campaign for the
faculty.

Both Boldt and
Conneman stressed
that the advantage of
endowments is that
they provide funds
in perpetuity. Boldt
said that about ten
percent earnings can
be expected from an
endowment. About
four percent is used
for the spending pur-
poses of the endow-
ment and the other
six percent goes to-
wards the endow-
ment to counter in-
fation.

Boldt said that
given the amount
of money raised so far
and the time left for
the campaign, the
goals of the College
might be exceeded.
An ideal level to at-
tain would be $110
to $120 million he
said. That amount
would cover the
needs of the College.
Any surplus would
be used to develop
a permanent fund-
ing base for the Col-
lege.

The campaign
provides great prom-
ises to fill many needs. “This is the most
exciting position of my career,” said
Boldt. ■

by Brett Ainsworth ’92
The Cornell University Insect Collection, the Ecology and Systematics Omnitology and Mollusk Displays, the Amor Teaching and Research Forest, and the Library of Natural Sounds are some of the most unique and extensive collections and facilities of their kind in the country. However, they still remain relatively unknown to many of the students, staff and faculty at Cornell.

Not for people who are squeamish about bugs, the Cornell University Insect Collection, part of the Department of Entomology, is one such example. The collection totals about five million insects representing about 200,000 species. This is the second largest university-based insect collection in the nation, and the largest at a land grant college, according to curator James Liebherr.

The collection is irreplaceable as it includes many specimens of insects that can no longer be accumulated, such as tropical butterflies from Indonesia. It also boasts 6000 type specimens, insects that were observed by the person who named the species. Liebherr said that several former Cornell professors have named dragonflies, wasps and moths.

An insect display in the Comstock Hall lobby is open to everyone. The museum's insect collection is not open to the public though it is regularly used by Cornell and visiting scientists and graduate students. Specimens also go on loan; the collection fulfills between 60 and 70 requests each year from scientists around the world to borrow insects.

Scorpions and spiders, with huge, ugly tarantulas out of your worst nightmares, are balanced by a number of dainty butterflies. With dazzling iridescent blues or elaborate patterns in more muted shades of brown, these butterflies won't be found fluttering around Ithaca.

A large part of the display is devoted to exotic beetles from Malaysia, Brazil, New Guinea and other far-off, foreign locations. Big brightly colored and shiny, some are ominous, with imposing mandibles that look as if they could take a finger off. Some of the species displayed are weevils, the largest family in the animal kingdom, and scarabs, including a Goliath
beetle which can reach up to four inches in length. The beetles rightly deserve such a large part of the display since they make up 30 percent of all known animal species.

Ordinary and undesirable insects are included, such as termites, horse flies and stink bugs. Whether exotic or common, species in the display are labeled with descriptions for sightseers who may be completely unfamiliar with entomology.

While in Comstock Hall, visitors only have to go down the hall to find a display of mollusks and arthropods. Nautilus, queen conch and abalone shells sit side by side with scallops and spiny oysters. Along with the shells are photographs and explanations of the killer cones which "harpoon" fish and cowrie "hens" which sit on their eggs.

The rest of the display consists of members of the arthropods which ordinary beachgoers might tend to group with the mollusks. These include barnacles, bat crabs and horseshoe crabs. The most impressive sight is a lobster claw from 1839; the claw is so large that the body of the lobster had to be at least two feet long.

Another hidden treasure resides in the first floor lobby of Corson-Mudd Hall. The bird display of the Section of Ecology and Systematics. This inconspicuous display contains specimens ranging from a human-sized emu to a thumb-sized hummingbird. Wrens, crows and gulls share the display with a toucan, a quetzal with its ostentatious bright green feathers and a lyrebird whose tails feathers resemble the ancient musical instrument.

The display in Corson-Mudd is part of a larger, unmounted teaching collection at the Research Park. According to Kevin McGowan, head of the bird and mammal collections at the Research Park, the bird collection was started shortly after the founding of Cornell. Several of the specimens in the collection are over 100 years old and date back to this time. McGowan said that the collection was greatly added to by the son of a Cornell professor, Louis Agassiz Fuertes, an internationally known bird artist. After his death, the bird specimens he used for his paintings were donated to Cornell.

For those who like to do their learning outdoors, Cornell has many offerings, on and off the main campus. Twenty miles away in Van Etten is the Amott Teaching and Research Forest. Run by the Department of Natural Resources, the 4,025 acres of land, a little over six square miles, are used by Cornell scientists to conduct projects ranging from timber-yield surveys to maple syrup production. The forests, fields and streams are home to native wildlife including deer, great blue heron, coyote, bear and wild turkey.

Although the forest is owned and operated by Cornell University, it is open to the public for hiking, cross-country skiing, picnics and other daytime activities. Hunting is allowed by permit, and hunters are asked to keep a journal detailing the animals seen and taken.

In the northeast corner of the forest, three self-guided tours of the managed stands of oak, beech, sugar maple and red pine are being developed, said Don Schaufler, forest manager. Numbered paths have been set up through different vegetative types: old field, young pole stand (6 to 10-inch diameter trees), and saw timber trees. Those interested in forest management can study the effects of techniques of clear cutting and selective cutting of poor quality trees in these types of areas. Although the interpretive information is not posted yet, Schaufler predicts that the saw timber tour will be finished by the spring of 1992 at the latest.

The sugar house and sugar bush are open to those interested in maple syrup research and Schaufler is willing to explain just about anything in the forest to interested groups.

Another unusual feature is an over-100-year-old totem pole located by the main lodge. Carved by a clan of Tlingit Indians from the coast of Alaska, it was removed by the Hamman expedition in 1887. Schaufler said that only a portion of the totem pole remains because it has been cut many times to fit various buildings.

Another unique research facility is the Cornell Laboratory of Ornithology. The lab runs the Library of Natural Sounds, the largest collection of its kind in the world, according to curator Gregory Budney. It consists of more than 80,000 tape recordings of bird songs and mammal, amphibian and insect noises. About 400 species are represented.

The most famous sound the library contains is the only known recording of the voice of the ivory-billed woodpecker, a species once thought to be extinct. According to Budney, recordings made of the ivory-billed woodpecker in 1935 were crucial in the rediscovery of a race of these birds in Cuba in 1986. If the recordings had not been made, the scientists would not have known what to listen for when they went out in the field.

The library has produced albums and cassettes of these sounds, including the well known Peterson's Field Guides to Bird Songs. The sounds are also used by birdwatchers, musicians, ad agencies, movie producers, museums, zoos and researchers in bird behavior and ecology. The library has installed a visitors' sound studio so that knowledgeable researchers can do their own work without tying up one of the work studios.

Whether your interest is bugs, birds or just their noises, you can find it at Cornell. You're going to have to look a little, but it will be worth it.

by Dana Nigro '93
IT IS NOT OFTEN THAT CORNELL STUDENTS are given the opportunity to work on a project that will have a significant impact on the City of Ithaca. But with the help of an $800 grant from the Cornell Faculty-Fellow-In-Service Program, students in the class, “Design and Plant Establishment,” have that chance to use their classroom knowledge to benefit the Ithaca community.

The Faculty-Fellow-In-Service Program is a means for Cornell undergraduate students and faculty to work together on community service projects. The “Design and Plant Establishment” project is one of 17 to have received grants from this program, explained Professor Stuart Stein of the Department of City and Regional Planning.

The class is co-taught by the husband-and-wife team of Professor Peter Trowbridge in the Department of Landscape Architecture, and Professor Nina Bassuk ’74 in the Department of Horticulture and Ornamental Horticulture. Currently, the students are drawing up plans to beautify a neglected strip of Old Elmira Road, which stretches from Baker Park to Route 13 in the City of Ithaca.

Most of the students in the class are landscape architecture majors, and one of the main objectives of this class is to teach students about the processes involved in redesigning various types of sites, Bassuk said. Trowbridge added that Bassuk believes that this class allows students to “try out professional practice in landscape architecture,” and the redesigning of Old Elmira Road is a way for them to integrate the information that they have learned in the course.

Bassuk explained that this specific area of Old Elmira Road is a problem for Ithaca. “It has been highlighted as one of the areas that the city really wants to do something about,” she said. Trowbridge added, “It’s really a mess... It’s probably one of the most neglected sites in the city.”

According to Bassuk, the goal of their class project is to redesign this previously ignored area with the expectation of landscaping in the spring. She explained the students’ job is to decide what the ground plan will look like, and to choose what types of trees, shrubs, and other plant life will be used. The students have to consider features of the area, such as drainage, elevations and utilities when drawing up their plans.

Although it is such a problem area for the city, Trowbridge explained that the plans that the class are preparing are “something that the city couldn’t otherwise do right now.”

Bassuk and Trowbridge’s venture is one of many diverse projects that have received funding from the Faculty-Fellow-In-Service Program. Ruth Bounous, a Human Service Studies professor in the College of Human Ecology explained that the general purpose of this program is to “provide small grants to faculty who are going to work with students on community service projects.” Bounous is the former chairperson of the program’s governance committee, which manages the program.

Stein is the current chairperson of this committee. He said the way the Faculty-Fellow-In-Service Program works is very straightforward. “We offer grants up to $2000 to faculty members who have to submit a proposal for a project,” Stein explained. The governance committee reviews proposals for which grants are requested, and works to help the faculty receive the funding they need.

Bounous explained there are two major goals of the Faculty-Fellow-In-Service Program. “One goal is to provide increased opportunities for [undergraduate] students to work alongside faculty. The second goal is through that partnership to provide service from Cornell to the community,” she said. But this is not necessarily confined to the Ithaca community. Stein said this program has funded an irrigation project conducted in Mexico, and an extremely successful literacy project implemented in Harlem.

All of the administrative details of the program are handled by Cornell visiting lecturer and Tompkins County Legislator Deborah Dietrich ’80. She cites Bounous’s second goal as a main reason for her involvement in the program. “I’m very interested in getting Cornell involved with the [Ithaca] community,” Dietrich said. She also said that she wants “to make that linkage with the university and the community.”

The Faculty-Fellow-In-Service Program began in June 1990, and so far it has given

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**Landscaping Town-**
20 grants ranging from $500-$2000 to faculty members spanning across 15 different departments, Stein explained. "The availability of [these] small grants will encourage faculty members to organize community service programs with undergraduates," Stein said. Dietrich added that this money is "a little bit of an incentive for a lot of faculty so that the expenses are not out of their own wallets."

Bounous explained that the Faculty-Fellow-In-Service Program's money comes from The President's Fund for Educational Initiatives, which is money from anonymous donors given specifically for undergraduate education. Stein said a total of $40,000 dollars per year for three years is allotted for this particular program. He added that the efforts of both President Frank Rhodes and Vice-President Larry Palmer have been responsible for initiating the Faculty-Fellow-In-Service Program.

Professor William Carlsen of the Department of Education is the representative from the College of Agriculture and Life Sciences on the Faculty-Fellow-In-Service governance committee. He explained that the program was originally formed by the three-year-old Public Service Network, an informal group of faculty, staff, and students devoted to community service. Carlsen was involved with both the Public Service Network and the Faculty-Fellow-In-Service Program from their inceptions. "Public service should be part of the academic mission of the University," he explained. "This program helps people to realize the intrinsic rewards of service... We're all richer if we give a little bit of our time to something other than putting bread on the table."

Although this program does provide a service for the community and is very rewarding to those involved, Stein explained that the program still seeks to involve more faculty. "A lot of people don't even know that this program exists," he said. Stein also explained that he wants to increase the number of students involved with the Faculty-Fellow-In-Service Program. He said most of the projects only involve a relatively small number of students.

The Old Elmira Road beautification project is an exception. There are 45 students in the class, all of whom collaborate on the project.

Ianthina Thung '93 is a landscape architecture major in the class. She said that the project will give her a lot of practical experience "because it is something real and it will affect the city."

Will Andersen '93, also a landscape architecture major, is excited about being involved in this project. "This is the closest we can get to real life projects," he explained.

Thanks to the Faculty-Fellow-In-Service Program, the Elmira Road beautification project is an excellent way to foster positive Cornell-Ithaca relations by integrating class work and community service. It is a project in which all of those involved will benefit. Andersen enthusiastically remarked, "Ithaca is looking forward to seeing what Cornell students can contribute to the city." "

by Bonnie Zucker '93

Gown Relations
Association of a Lifetime

Dean Liberty Hyde Bailey (at right) founder of the CALS Alumni Association sits with students.

From finding out how to ship Cornell ice cream out of state to helping alumni connect with Cornell researchers for professional information, the College of Agriculture and Life Sciences Alumni Association provides a means for alumni to continue to be active members of the College community. "Our top priority is to respond to the needs of alumni," said John Sterling '59, Director of the College of Agriculture and Life Sciences Alumni Association. "We follow through with every request that a College alumna or alumnus asks of us...we serve the entire 37,000 person College alumni base," he explained.

Since its founding in 1909 by then College Dean Liberty Hyde Bailey to "promote fellowship among all students, past and present; to advance the interests of the College in all ways; and to further the interests of country life," the organization has adapted and expanded its mission. Today its main focus is five-fold.

Beyond these founding principles, the association serves to recognize outstanding students and alumni. It helps with the recruitment of new students to the College, aids students and alumni in career placement and information gathering, and promotes the image of the College.

Yet the College of Agriculture and Life Sciences Alumni Association is just one of several dozen Cornell alumni groups. Each of Cornell's separate colleges has their own alumni association (except for the College of Arts and Sciences) whose main function is to serve the individual college and its alumni. These college associations are just some of the many alumni groups in existence—groups like the Cornell Association of Class Officers, the University Council, and the various Cornell Clubs and associations that exist around the world. What do all of these groups have in common? They are all members of the newly formed Cornell Alumni Federation.

Each college alumni organization, as well as the University's other major alumni groups, has a representative on the Cornell Alumni Federation board. The president of the College of Agriculture and Life Sciences, for example, sits on the federation board to represent the College. The federation was created last year to help the various alumni constituency groups increase communication. Jim Mazza '88, Director of Club Programs, explained that the "Cornell Alumni Federation's members serve to collectively strengthen the University's relationship with its alumni."

In general, the College alumni association's responsibilities lie in programming Dean/Alumni get togethers in alumni districts, an annual meeting/breakfast reunion, and various campus events. In addition, the association puts out two publications: tri-annual Agriculture and Life Sciences News for all 37,000 alumni, and Newsbreak, produced monthly and distributed to 250 association leaders. A membership roster is published annually in ALS News.

Currently, leadership for the organization is provided by a small core of salaried staffers and 250 key volunteer alumni leaders who are posted throughout the country. A Board of Directors who generally serve also as District Directors acts as association coordinators for their geographic areas. There are 22 New York state districts, four out-of-state districts and one district for Canada. Leadership teams meet annually for planning and training conferences. The College supports some of the organization's programming, but 95 percent of the costs are covered by membership dues and event registrations.

Over the last six years, new approaches in recruiting members have been initiated. The result is a dramatic shift in membership demography. The association saw an extreme rise in membership...
when it began offering two-year complimentary memberships to new graduates. This, in conjunction with the standard dues paying two-year and lifetime membership offers, and a new four-year membership offer, helped the classes of the 1980s quickly become the largest portion of the association's total membership.

However, along with this shift in membership came a need for the group to re-examine its function. In response to this need, former College of Agriculture and Life Sciences Alumni Association president Stephen Teele '72 assigned a task force to conduct a five-pronged study of the association. The task force is made up of College faculty, students, administrators and alumni, as well as staff from other college alumni associations.

This study examines the mission of the association; service aspects of the group in terms of career responsibility, student recruitment and its responsibility to relate with students prior to graduation; programming such as scholarships, Dean/Alumni get togethers and on-campus events for alumni (such as recognition programs for students, alumni and retiring faculty alumni); membership (encompassing dues structure, fees, role of dues package and membership levels), and lastly, organization in terms of future leadership recruitment and development.

"You can't keep growing without looking at yourself," commented Sterling about the study. "Success brings changes with it." He said the association's intent is to make it easy for alumni to be involved and informed. "We need this task force to see if programs and services are keeping up with membership growth. If they're not, we need to rework them."

For example, one way the organization has implemented its goal to get more recent graduates involved is by placing student representatives on its board of directors. Andrea Jeffers '93, one of two student representatives on the association's board, explained, "Most alumni don't get involved in the association until later in life. It's important to cultivate the idea that the College alumni association is a valuable asset while Cornellians are still undergraduates."

Jeffers functions as a liaison between alumni and students. She said that if the association can demonstrate to students the importance of being actively involved in College activities before they graduate, chances are that they'll want to stay involved. "Students need to understand what the College of Agriculture and Life Sciences Alumni Association is before they leave campus," asserted Jeffers.

One way the alumni association connects with undergraduates is by conducting Career Conversation days, in which College alumni come to campus and speak with students about their various occupations. Also, student directors, like Jeffers, approach graduating seniors by mail, inviting them to sign up for their two-year complimentary membership. In another attempt to make contact with undergraduates, the organization has an exhibit in Mann Library during the spring semester and has a sign-up drive during the College's senior barbecue near graduation day. Additionally, Jeffers told of a proposal to initiate a "Spring Fest" type of function on the ag quad this year which would be sponsored by the association and "serve as a means for getting our name out there."

Sterling indicated the importance of communicating with alumni, "Staying informed about research and classroom activities within the College is very important to alumni." Beyond that he said alumni have a variety of specific interests such as acquiring information related to their careers and encouraging young people from their own communities to attend Cornell.

"Alumni are especially helpful in the recruitment process," said Sterling. "The College isn't always portrayed accurately to students, particularly in rural areas. They're often told that Cornell is too large or too expensive to attend. Alumni fill that void in translating the real mission of the College."

Both Sterling and Jeffers suggested that the task force will find that the association needs to develop a better way for alumni and students to communicate. Speaking from her personal experience, Jeffers admitted, "Once I got this position I began to realize just how valuable an asset alumni really are." She explained that alumni can help students with career advice and networking and students, in turn, can give alumni opinions about the state of the College and advice on campus programming. "Since I saw how important alumni involvement in College affairs was I couldn't help but pass my enthusiasm along," revealed Jeffers. "Today, both my grandparents have joined the College of Agriculture and Life Sciences Alumni Association and that's good enough for anyone!"

While the future will become more clear in the near few months as the task force begins to report its findings, the association continues to be a strong asset to the College community. Efforts to communicate the mission of the organization to undergraduates should further strengthen its membership base. So take Jeffers' advice and get involved. As she said, "You can learn a lot from alumni!"

by Monica E. Bernstein '93

An alumna spends time with her classmates during the annual reunion.
Cornell Tradition Fellows take Ithaca children to a Big Red football game as a community service activity.

Untraditional Tuition

CORNELL IS NOTORIOUS FOR MANY things—continuous construction, omnipresent canines, nonexistent parking—not the least of which is tradition. Cornell has got traditions tucked into every alcove, every nook, every crack in every wall of every building.

Many of these traditions are common knowledge, like Dragon Day, or the virgin myths surrounding the suspension bridge, but others, like the Cornell Tradition, are hardly at the forefront of the typical Cornellian's mind.

The Cornell Tradition, headquartered in 101 Day Hall, is essentially a financial aid organization that recognizes students for academic excellence, community service, and paid work experience. In 1982, an anonymous group of alumni and friends pledged more than $7 million to get the program off the ground.

Last year the Tradition gave approximately one million dollars to about 450 students, and they have repeated this act this year. Students receive this money (each receives about $2,100) in the form of Fellowships, which replace a portion of the student's loan in his or her financial aid package. Students who meet Tradition standards but do not demonstrate financial need receive book awards—$250 to cover the cost of books and supplies. This sum is credited to the student's bursar account.

The benefits are great, but so are the standards. While maintaining a 2.3 grade point average, Fellows must complete 75 hours of community service during the course of the academic year. In addition, upperclass Fellows must work a total of 250 paid hours, while freshman Fellows need to work 200 hours during the academic year.

The program supports 563 students, 176 of whom are students in the College of Agriculture and Life Sciences. These students find many ways to integrate the Tradition and its demands in their lives.

Scott Klein '95, a business administration and economics major, said the requirements of the Tradition have had no adverse effects on his social or academic life.

"I'd be involved in other things anyway, so it's not time lost," he said. "It's not detrimental, it's fun."

Klein does not work at Cornell; he plans to complete his work requirement at home during the winter semester break. As for his community service, Klein is a member of the Tradition's Student Advisory Council (SAC) and the Tradition's Special Events Committee (SEC). The SAC is a body of Tradition Fellows (representing all the colleges and years of study if possible) that sets up committees to plan events for Fellows, for example, or to improve relations with faculty or alumni. The SEC plans social events for Fellows such as ice time at Lynah Rink or a discount movie night at Cornell Cinema.

Klein doesn't seem to mind devoting time to the Tradition. "I think it's a very useful, important program that tries to better the community," he said. "It makes people more active, more multifaceted."

Heather Toomey '93 expressed a similar view of the program. "It doesn't interfere. Actually, it broadened my horizons."

Toomey works in the Agriculture and Life Sciences Career Development Office as a peer advisor and fulfills her community service obligations through the Agriculture and Life Sciences Ambassadors, where she serves as the publicity chair of the steering committee, and through house philanthropies for the Delta Delta Delta sorority. Her job involves interacting with students looking for jobs and internships—answering questions, critiquing résumés and conducting practice interviews. In addition, she is managing editor and editorial consultant for SUNY CDO, a statewide publication for career development officials.

"I would have worked and been involved in the community anyway," Toomey said, "so, it's nice to be rewarded for it."

The Tradition is one Cornell tradition that deserves to be removed from its crack in the wall in Day Hall and placed in the minds of Cornellians, right next to the suspension bridge virgin legends.

by Janet M. Clesse '93
Faculty in the News
Receiving the Paleobotanical Society International Medal was H.P. Banks, the Liberty Hyde Bailey Professor Emeritus of Botany.

The Chancellor’s Award for Excellence in Teaching has been awarded to Brian O. Earle by the State University of New York. Earle serves as a senior lecturer in communications for the College and as director of the Empire State Food and Agriculture Leadership Institute.

Paula Horrigan won the Distinguished Teacher Award from the National Council of Landscape Architects. Her selection was based on her innovative courses and outstanding evaluations by students.

Janet Knodel of the New York State Agricultural Experiment Station at Geneva received one of two awards for outstanding contributions ever given by the United States Department of Agriculture’s Animal and Plant Health Inspection Services. She serves as Survey Coordinator of the Cooperative Agricultural Pest Program in New York State.

Gamma Sigma Delta, the honor society of agriculture, awarded Richard E. Ripple, chair of the Department of Education, a certificate of membership “in recognition of high scholarship, outstanding achievement and service to agriculture science.”

Foundation Dedicates Field Laboratory
The Marion A. and A. Percy Leon Foundation gave a $1 million gift to the College’s Research Farm at Aurora. Besides creating a field laboratory, the foundation provides financial aid for students.

Three Geneva Station Scientists Honored
The American Phytopathological Society presented the Lee Hutchins Award to Drs. Roger Pearson and David Gadouy of Cornell’s New York State Agricultural Experiment Station at Geneva. They were recognized for their work on the powdery mildew disease of grapes. Caused by a fungus, mildew is considered the most serious disease of grapes in New York and the world. By creating treatments that eradicate the overwintering fungus, the development of mildew is delayed. As a result, grape growers reduce their pesticide use.

Also honored by the APS was Dr. Dennis Gonsalves for research on viruses that attack several fruit and vegetable crops. The crops include tomatoes, apples, grapes, cucumbers, melons and summer squash. Gonsalves was also named a fellow by the society.

Alumni Aid the Center for the Environment
John Dyson ’65 has been credited with taking a major leadership role and creating a fund-raising strategy for the center.

Kenneth Iscol ’60 funded production of a twelve-minute video titled ‘Endowment for the Planet’ which won a 1991 Telly Award. He has also made one of the lead gifts to establish a visiting scholars program for the center.

Austin Kiplinger ’39 is featured in the video about the center’s research, teaching and outreach activities.

Movie star Christopher Reeve ’74 was recruited by Iscol to do an on-camera introduction for the video.

Inexpensive Technique Assesses City Tree Populations

Geneva Station Introduces Three Plant Varieties
Introduced by Cornell’s New York State Agricultural Experimental Station at Geneva were a new strawberry variety, cherry variety and apple rootstock. The strawberry, named Seneca, produces large yields, large fruit size, and firm fruit. Growers in the Great Lakes Region should expect the variety to be well suited for shipping because of tough skin and firm flesh. Royalton, the new cherry variety, has been noted for large fruit and resistance to disease. The rootstock, dubbed Geneva 65, dwarfs trees to about 30 percent the size of a normal tree. Trees with the new rootstock mature early and fruiting begins years sooner than with normal trees. Another trait is increased disease resistance.
About the Issue

The College of Agriculture and Life Sciences takes great pride in the research it performs. This issue of the Countryman looks at two recent and very different projects involving cows. New findings regarding pesticides are studied as well. On the campus scene, we examine some of the college’s current controversies, including the potentials and problems of undergraduate teaching assistants. On a less serious note, the colorful history of the Countryman, the work of the President’s Council of Cornell Women, and the best places for facetime on the ag quad are all explored. Finally, we will look at how a landmark in need of help revitalized a local community.

Note:

Traying as illustrated on page 5 of the December 1991 issue is an underground activity not supported by the University and specifically prohibited.

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(Continued on Inside Back Cover)
Revitalization of a Community

IT'S A STRAIGHT ROAD THAT TAKES you ten miles outside of Ithaca, New York, to the rural town of West Dryden and there's not too much scenery along the way. But you'll know when you get there. Just look for the white church with the silver domed roof at the corner of West Dryden and Sheldon roads. You can't miss it, it is one of the only churches ever to have a round steeple and it's the only structure of its kind for miles around. Even planes flying out of Tompkins County Airport rely on this 159-year-old national landmark as a guide for their flight patterns. Drive a few hundred feet further and you'll be at the home of Department of Communication's senior lecturer Brian Earle '68, MPS '71.

When Earle, a lecturer in the Department of Communication, and his wife Jody moved to West Dryden in 1972 there was little in the way of a West Dryden community. The dilapidated nineteenth century structure that abutted their property was owned by a group called the West Dryden Community Association and a sign hung above its sagging doorway that read, "West Dryden Community Center 1966." But besides this worn out building and a small group of dedicated resident association members, West Dryden was a town with no sense of community.

Yet West Dryden was not always like this. In 1811, under the guidance of the Reverend George W. Densmore, the first Methodist class in the Town of Dryden at West Dryden was organized. The Methodists organized a church society that met in members' homes for four years until a school building was built in 1815 to house school and church services. As the community grew the society members saw a need to erect a church building. In 1828 the members moved to incorporate their society as the Union Society of the Methodist Episcopal Church at Union Corners (through the 1820s the area was, for some unknown reason, called Union Corners) and four years later plans to build a meeting house to serve as a church for the Union Society began.

The society purchased a parcel of land from Israel and Sally Hoyt and Chapman and Esther Fulkerson on what is today the corner of West Dryden and Sheldon roads. The builder, Peter Conover, was given strict instructions by the church as to the requirements for the building's construction. He lived up to their expectations, as the building still stands a century and a half later.

Until 1948, the building served as a church. But in 1948, because West Dryden's population was declining and churches in neighboring areas were consolidating, the society found it could not afford to keep the building and was forced to give it to the Town of Dryden. The town used the structure as a storage facility and a polling place during elections for the next eighteen years. In 1966, the Greater West Dryden Rural Community Association, Inc. was formed and began holding meetings in the old church. By 1970 the Association had bought the building from the Town of Dryden at the small price of one dollar and proclaimed it to be the "West Dryden Community Center," the name it still bears today.

Earle explained that he "watched the West Dryden Community Association disintegrate," over the first ten years of his residence. But he and his wife felt a special responsibility to the neglected structure that stood outside their dining room window. As it approached its 150th birth-

West Dryden Community Center in 1984, before the restoration efforts were underway.
day in 1982 they were determined to give it the recognition it deserved.

The Earles began their quest by speaking with Historic Ithaca, a group that works with various organizations to preserve historic buildings. Earle said it soon became obvious that the structure was, "architecturally unique as it has a round steeple [as opposed to the usual pointed steeple] and dates from the earliest years of settlement in the area." He learned that the building might be worthy of receiving landmark recognition and set about to achieve just that.

Earle turned to Jeff Cody, a visiting professor in the College of Architecture, Art, and Planning for help. Cody had students in his Measured Drawings course construct a blueprint of the building while a student in Cody's Building Preservation course compiled a survey of the building.

Megan Shull '91, a student in the Department of Communication, spent 1990 researching the history of West Dryden as part of the University's Faculty Fellows program. Earle, as her faculty fellow, sponsored her endeavor, remaining in close contact with her as she conducted her research. She pored over old registers and spoke with residents, collecting anecdotes and memories, to discover the unwritten history of West Dryden. Earle intends to share the results of Shull's work with the greater West Dryden community.

The Earles took the drawings and the survey done by Cody's students and submitted them as part of the application for the building to achieve landmark status. In July 1991 New York State gave the building landmark recognition and that following September 1991 the federal government did the same.

Another member of the Cornell community, Corwin Holtz, who is a Dairy Management and Animal Science instructor in the ag college, and his wife Debbie have been working with the Earles and the other members of the West Dryden Community Association to make the Earles' dream come true. They want to give West Dryden back its community and they want the church at West Dryden and Sheldon roads to once again serve as the community's meeting place.

The West Dryden Community Association has been working diligently to achieve these goals. Since the Community Center was declared a landmark, the group has conducted a massive awareness campaign within the greater West Dryden community.

Advertising in the \textit{Ithaca Journal}, the \textit{Ithaca Times-Monitor}, the \textit{Grapevine}, and a local publication called the \textit{Shopper}, the group publicizes its annual "Old Home Days" and community suppers at the community center. West Dryden magician and ventriloquist Martin Castle has even been known to donate a show at the old church with the round steeple. Cornell Cooperative Extension has held a youth nutrition camp at the center and the building is currently being rented out to a dog training class and a cub scout group for their weekly meetings.

Since the West Dryden Community Association is a United Way organization, the United Way subsidizes the cost of maintaining the community center. This allows the association to make the building available at no cost for any youth or community oriented activity. The building is also available for private functions at $20 a day. The center is equipped with a kitchen facility and Earle said there have been a number of wedding receptions and family reunions held there in the past couple of years.

In November 1991 the community celebrated the church building's receipt of national landmark status by inviting all residents to a party at the community center. Earle said that members of the Fulkerson family were present at the event. "These Fulkersons are direct descendants of Chapman and Esther Fulkerson, the original signers of the Church at Union Corners's deed," he exclaimed.

"Alpha Gamma Rho was instrumental in running last year's annual Halloween party at the center," said Earle, himself an alumni member of this Cornell agricultural fraternity. "The brothers [and the little sisters] helped decorate the place and got all dressed up . . . the kids just loved it," he said. The fraternity also helped with the building preservation last year as its members spent a day painting the adjoining 25-year-old playground, putting up scaffolding, painting the front of the church, and cutting overgrown brush.

Christopher Hart '92, president of Alpha Gamma Rho explained his fraternity's
involvement, "Brian is a member of our brotherhood. He needed our help and we were more than pleased to be there for him and the West Dryden community."

However, Earle said there is still work that needs to be done. One project will be to insulate the century-and-a-half-old building. "We're looking for grants right quick." The College of Agriculture and Life Sciences' Art of Publication class, a course taught by Department of Communication lecturer Marcelle Toor, is helping Earle by designing a brochure that his organization can use for advertising. "Doing a real life project like this adds a lot of value to the work you produce in class," said one of Toor's students. "It makes you feel good about what you're studying."

Once these brochures are distributed, Earle hopes that West Dryden residents will have a much greater awareness of the association and all that the community center has to offer. But in the meantime funds still have to be raised and the work still has to get done. Earle said he is looking for someone to donate a wrecking crew to be used "once the refurbishing starts."

Looking to the future Earle tells of his hopes for a senior citizens group to start meeting in the center, for more people to rent the building for private affairs, and for donations to preserve the building to start coming in. Earle is pleased with the Cornell community's response to his cause and said he hopes to get as great a response from his West Dryden community. At present the future looks bright and the West Dryden Community Center continues to revitalize its community.

by Monica Bernstein '93
THE AGE OLD PRACTICE OF MILKING COWS IS SOON TO enter the age of environmentalism. Thanks to a new milking system designed by Cornell researchers in the Department of Agricultural and Biological Engineering, New York state dairy farmers could save more than $2 million per year on energy costs.

This project was funded by the Electric Power Research Institute, the National Food and Energy Council and by New York State Electric and Gas, explained Professor David Ludington '56, MS '59, the principal investigator of the project. Ludington had three collaborators on the project: research associate Roger Pellerin, Associate Professor Daniel Aneshansley, and Fangjiang Guo PhD '91, who worked on the system for his PhD thesis.

"The present conventional milking system functions all right, but it is very inefficient," Ludington explained. This conventional system uses a vacuum pump which operates at full capacity all of the time, regardless of the actual amount of air needed.

"Fifty percent, or sometimes 80 percent of the air being pumped is [usually] not used. This is also referred to as reserve capacity," Ludington said. The vacuum pump removes the air which enters the system, to provide a stable vacuum, and is necessary for proper milking to occur. The stable vacuum serves other purposes, such as reducing the spread of diseases, like mastitis—an inflammation of the udder.

"That reserve capacity is there for those instances when there is a disturbance, and all of the rest of the time it's being wasted," Ludington said. An example of a major disturbance, according to Ludington, is when a milking unit falls off the cow. In this case, considerable air will enter the system, and must be removed quickly. But when there is no such disturbance this energy is wasted.

According to Pellerin, the current amount of energy the conventional milking system requires represents over 20 percent of the electrical usage on New York state dairy farms. But with the adjustable speed drive ASD/ dual vacuum system designed by Pellerin and Guo, this energy usage can be cut in half.

The ASD/ dual vacuum system is not completely different from the conventional system, but rather is a modification of
Ingenuity

it, Pellerin explained. The adjustable speed drive matches the vacuum pump capacity with the air flow needs of the system. Under normal milking conditions, the pump runs at a decreased constant speed. When more air must be pumped out, such as during a disturbance, the motor speed is increased in order to accommodate the problem.

Unfortunately, the ASD cannot respond fast enough on its own to maintain a stable vacuum. To alleviate this problem, the researchers added a dual vacuum reserve system which gives the ASD “a boost,” he said.

“Our system uses a lot less energy, but still takes care of the disturbances,” said Ludington. He estimated the system would save an average of $500 each year to each dairy farmer using it. That may not seem like a lot of money, but with about 10,000 dairy farms in New York state, the savings could be quite substantial. There would be great savings even if only half the dairy farms adopted the system, Ludington explained. Pellerin added, “The application of [the milking system] is not just here in the U.S., but all over the world... it could have a wide range of influence.”

For the most part, this milking system is perfected. “I cannot see any major problems with it,” said Guo. He explained that he and the other researchers still want to work on a more energy efficient way to run the washing cycle, which operates after each milking. The washing cycle takes a fraction of the milking time, Ludington said, so the energy savings will not be as substantial as those from the milking process. Nonetheless, they deem it an important area to pursue.

Each ASD/dual vacuum system costs approximately $2500, and the payback for each farmer would take 4-5 years, Ludington said. Pellerin noted, “Some of these large [milking] facilities... run almost 24 hours a day,” and therefore would experience a payback in a shorter amount of time. In addition, Ludington explained that because utilities are interested in saving energy, sometimes they give rebates for energy conservation practices. If utilities choose to give rebates to farmers who use this system, then these farmers would receive a quicker payback.

Although this system will turn out to be a cost-saving mechanism for dairy farmers, Ludington said it probably won’t have an effect on milk prices for consumers. He explained that there are many factors which determine the price of milk in stores. The amount of energy used to milk the cow is just a small fraction of every individual milk carton’s price.

The ASD/dual vacuum system is not yet commercially available, Pellerin explained. Currently there are companies looking to license and market the system, and it has a patent pending. Ludington said the system may be put to commercial use some time in 1992.

Because the system is presently not on the market and most dairy farmers are not aware of it, whether or not they will be receptive to it can be based only on speculation. Dairy farmer Ron Space ’53 of the Department of Animal Science, is knowledgeable about the ASD/dual vacuum system, and he offered a very optimistic outlook about its future in the dairy industry. Space explained, “[Dairy farmers] would be receptive because the energy cost is a very significant component of dairy farming.”

Space has been a dairy farmer for 35 years. He also works at Cornell’s Teaching and Research Center in Dryden, where some of the testing of the system occurred. From what Space has seen of the testing he concluded the system “seems to function very well and it looks very promising for commercial use.” Space also said once the system is available on a commercial scale, he thinks dairy farmers will readily choose to use it for their milking practices.

Ludington is also optimistic about the future for the ASD/dual vacuum milking system. “As long as it does the job—and we’re sure it does—and as long as it’s cheaper [it will be a success],” said Ludington. He added there are other benefits of the system besides just conserving energy. He explained that the system will significantly reduce the noise level of the milking procedure and decrease heat and oil lost in the pump exhaust.

Because of the work of Cornell researchers, milking procedures are soon to become a lot more energy efficient. And in this environmentally conscious time, their system is sure to be well received.

by Bonnie Zucker ’93
FACETIME. THAT POPULAR CORNELL tradition of seeing people and being seen remains a favorite practice among Cornell students of today, and the students of the College of Agriculture and Life Sciences are no exception.

Every day, the ag quad buzzes with the sound of thousands of students on their way to and from classes or meetings. Brightly colored jackets and backpacks dot the snowy quad in the winter, and students linger under shady trees, bringing life to the area during spring. For the typical aggie, the quad hums with an excitement like no other part of campus.

“There’s always something interesting bound to happen up here. I always run into someone I haven’t seen in a while, or I’ll hear a funny story or some juicy gossip,” reported Allison Weiss ’93.

The quad becomes almost a second home to many students, who report spending large chunks of their days on campus. It represents the familiar, something which is appreciated when students are far from home. Michelle Catanzaro ’93 agreed. “The ag quad is really small [in the way that] you’re very likely to bump into people you know, but it’s definitely big enough to keep it interesting.”

When ag students are lucky enough to grab some free time between classes, where do they go?

Trillium, the student dining center which opened its doors less than two years ago has gained great popularity among ag students. Conveniently located in Kennedy Hall, in the southwest corner of the ag quad, Trillium swarms at lunchtime with a seemingly never-ending army of students, hungry for lunch and eager for some serious socializing. The large, wooden tables and soaring, glass-covered walls create a friendly atmosphere conducive to conversation and good times.

After the difficulties of searching for a table and elbowing one’s way through the food lines are over, the fun can begin. Cara Bonomolo ’93, a frequent Trillium customer explained, “Trillium is great. It’s so open, you can see everybody who’s there all at once. It’s a good place to socialize and it’s right on the ag quad, so it’s very convenient...”

Another notable feature of Trillium, naturally, is the food, which is reputed to be very good. Trillium diners choose from a highly varied menu of entrees, soups, salads and desserts. As for the brown-baggers of the Cornell campus, Bonomolo added, “It’s one of the only dining halls where you can bring your lunch and still sit with everyone else.”

When students don’t have the time to wade through the Trillium crowds, the Alfalfa Room, located in the basement of...
Warren Hall, provides a less hectic alternative for the hungry aggie. The worn, 60s decor proves an interesting backdrop to the steady stream of today's modern students, drifting in to grab a bagel or muffin before their next class. Tables and couches line the walls, which feature a few traditional oil paintings and dated photographs of the ag quad.

The Alfalfa Room represents a convenient and social study break for many aggies. "I love the Alfalfa Room. We go there all of the time when we're supposed to be studying in Mann [library]," laughed Judy Hudock '93. "Then we end up spending an hour in there, talking and hanging out." Bonomolo agreed, "It's a place to be social without leaving the [library] building."

But Mann Library is more than just a place to study. It has become yet another place on campus to see and be seen in that face-time spirit.

Hundreds of students pass through Mann Library's circulation desk every day on their way to and from class. Often, they stop to greet friends or venture a peek into one of the two reading rooms on the main level.

The reading rooms are large, open areas flanked by rows of long wooden tables. Scattered magazines and newspapers add character to the area. Clusters of students gather to work or just hang out, keeping the sound level at a cheerful, constant buzz. All in all, the atmosphere is one of a lounge or cafeteria rather than a library.

Karen Hovorka '92 is a familiar face in McKay, the northern reading room. "I have fun in McKay . . . you can talk, eat, and drink. The same people go there all of the time, so it's kind of a social scene. Yes, I would say there are definitely McKay regulars."

The theme of familiarity carries great weight with most ag students. Weiss explained, "The ag college may have over 3,000 students, but it doesn't really seem that large, especially if you break it down by major or by the people you see in your classes . . . It can be very personal and very homey, and that's what I love about it."

There's always lots of face-time to be had while dining at Trillium.

Students pass through Mann Library's Circulation Room on their way to class.

Walking to class across the ag quad.

by Erica Fishlin '93
MOTHER NATURE HAS PROVEN HERSELF again. Researchers in the New York State Integrated Pest Management Program (NYIPM) will testify in her favor when battling against agricultural pests. Integrated Pest Management (IPM) is "a comprehensive approach to pest control that uses combined means to reduce the status of pests to tolerable levels while maintaining a quality environment," said Dr. Paula Davis, assistant professor in the Department of Entomology.

Over 300 projects have been undertaken by NYIPM since the program's start in 1986. The program has done work in the areas of dairy, field crops, ornamentals, fruit, and vegetables. The 1990 NYIPM annual report states the goals of the program are to work on "the health of the environment, the well-being of growers and their products, and the concerns of the consumer."

Several approaches are used in IPM programs, including the use of crop varieties resistant to pest attack and the use and conservation of natural enemies (biological control). Biological control may involve introducing natural enemies to control pests. Examples include the recent introduction of tiny wasps from China, which are the size of gnats, as a parasite of the corn borer. Dr. Michael Hoffmann, assistant professor in the Department of Entomology, does work which assesses natural enemies and their importance in an agricultural system.

Another method used in biological control is the inundative release of a natural enemy, according to Hoffmann. With this approach, the farmer applies the pest's enemy in mass quantity, like an insecticide, in hopes of overwhelming the pest. The natural enemy may die off but live long enough to damage the agricultural pest population. Part of Hoffmann's job is to educate county agents and growers in the use of IPM practices.

Davis emphasizes that despite the popular notion that IPM was created to eliminate pesticides, IPM is geared towards alternatives that may reduce pesticide use.

Pesticide reduction plays an important role in the NYIPM effort because it helps satisfy the goals of environmental health and consumer concern for safety. However, the convincing and central factor for farmers is economic. Reducing pesticide use through IPM practices can reduce costs for farmers according to the 1990 report published by NYIPM.

An example of pesticide reduction provided in the report concerns the grape crop. By using a risk assessment program funded partly by NYIPM, participating growers were able to reduce insecticide use up to 70 percent. The risk assessment program explained how to monitor for the grape berry moth, a major pest, and how to determine when to spray, if even necessary. Reducing the number of sprayings and the amounts sprayed can save the farmer money on pesticide expenditures and labor.

IPM practices have even been used on golf courses. Pesticide inputs on high-quality turf can be reduced about 46 percent, the 1990 NYIPM report stated. Natural organic fertilizers have been used to reduce fungicide use by between about 20 to 40 percent. These reductions result in healthy golf courses while saving money and pesticides.

Davis's research may help farmers save money, too. Davis does about half of her research on the western corn rootworm which is spreading into New York corn fields. Her work determined how many rootworms are necessary to cause economic losses of crops. She monitored the density of eggs in the soil and found the levels of infestation that cause losses for silage and grain crops. With this knowledge in hand, farmers using IPM practices can determine if and when a soil insecticide needs to be applied. Avoiding indiscriminate application of a soil insecticide can reduce corresponding labor and chemical costs for the farmer, making his operation more profitable.
An interesting lead that came from Davis's research involves the use of manure. With manure spreading practices, akin to traditional farming, the rootworm larvae are much less successful at finding corn roots on which they feed. Davis hypothesizes that this is because manure releases carbon dioxide which the rootworm uses to find the roots. Thus, with manure applied as fertilizer, the rootworm get misdirected. She plans to determine what levels of manure are necessary for this effect and any corresponding troubles that may be associated with runoff from the different manure levels.

When applying pesticides, farmers benefit from reliable weather forecasts. The New York Agricultural Weather Program, established in 1988, provides farmers with information helpful in deciding when to plant crops, apply pesticides, scout for pests, and cut and harvest crops. Separate forecasts are made for ten agricultural regions in the state. Included in the forecast are daily weather information and extended forecasts for up to 90 days.

“Researchers are not looking for a silver bullet.”

The use of IPM is a year-round effort, with each of the four seasons entailing different projects. Some projects in the fall include sampling soil and analyzing nutrients, estimating previous yields, and crop record-keeping. Winter projects, among others, entail IPM training and monitoring livestock for lice, mites and grubs. Spring and summer offer duties additional to farming, as well.

Davis said it is important to remember a few things when evaluating IPM: “Researchers are not looking for a silver bullet. Instead, they look for the use of multiple tactics to control pests.” In this way, researchers look for sustainable agricultural methods to satisfy consumers and farmers.

by Brett Ainsworth '92
IVY LEAGUE UNIVERSITIES AND NEW ENGLAND PREPARATORY SCHOOLS WERE ONCE SPRINGBOARDS FOR OLD BOYS' NETWORKS. MEN WHO HAD GONE TO THE SAME SCHOOLS TURNED TO EACH OTHER AFTER GRADUATION FOR JOBS AND ADVICE.

LAST YEAR, CORNELL UNIVERSITY PRESIDENT FRANK RHODES AGREED THAT IT WAS TIME FOR CORNELL TO FORM SUCH A NETWORK FOR WOMEN. HE INVITED OVER 100 PROMINENT ALUMNAE TO JOIN THE PRESIDENT'S COUNCIL OF CORNELL WOMEN.

"I SEE THE COUNCIL AS A NEW WOMEN'S NETWORK MORE THAN AN OLD GIRLS' NETWORK," SAID MARTHA ELLER MS '90, DIRECTOR OF THE PRESIDENT'S COUNCIL. "THOSE ARE ALL WOMEN WHO ARE VERY ACCOMPLISHED AND SUCCESSFUL IN THEIR OWN RIGHT. THEY ARE CORNELL ALUMNAE WHO FEEL A REAL DESIRE AND COMMITMENT TO HELP IN ANY WAY THEY CAN THE WOMEN COMING BEHIND THEM."

THE PURPOSE OF THE COUNCIL, ELLER EXPLAINED, IS TO ADVISE THE PRESIDENT ON THE STATUS OF ALL CORNELL WOMEN — STUDENTS, STAFF, FACULTY, ADMINISTRATION AND ALUMNAE. "THESE WOMEN WANT TO ASSIST IN BETTERING THE UNIVERSITY IN ALL WAYS POSSIBLE," SHE ADDED. THESE WAYS INCLUDE DEVELOPING LEADERSHIP OPPORTUNITIES FOR ALL CORNELL WOMEN, ATTRACTION OUTSTANDING WOMEN STUDENTS, FACULTY AND STAFF TO CORNELL, AND PROVIDING CAREER COUNSELING AND MENTORING FOR STUDENTS.


THESE WOMEN HAVE AGREED TO BAND TOGETHER TO BRING TO THE PRESIDENT'S ATTENTION ISSUES WITHIN THE UNIVERSITY THAT ARE OF PARTICULAR INTEREST TO WOMEN. "WE SEE OURSELVES IN A SUPPORTIVE ROLE WITH THE UNIVERSITY, WORKING WITH THE PRESIDENT TO EFFECT CHANGE," ELLER SAID.

"EVERYTHING THAT HAPPENS HERE AFFECTS WOMEN," CONTINUED ELLER. "WE'RE NOT A SEPARATIST ORGANIZATION. I LIKE TO THINK THAT WE ARE NOT JUST INTERESTED IN THE OBLVIOUS WOMEN'S ISSUES, BUT THAT WE BRING AN IMPORTANT PERSPECTIVE TO ISSUES THAT ARE OF CONCERN TO EVERYONE IN THE CORNELL COMMUNITY."

IN ORDER TO ADDRESS ALL MEMBERS OF THE CORNELL COMMUNITY, THE COUNCIL HAS DIVIDED ITSELF INTO SIX COMMITTEES: MEMBERSHIP, PROGRAMS, CAMPUS CONSTITUENTS (STUDENTS AND STAFF), FACULTY AND ADMINISTRATION, ALUMNI AND DEVELOPMENT. WHILE THE FULL MEMBERSHIP OF THE PRESIDENT'S COUNCIL MEETS TWICE A YEAR, EACH COMMITTEE MEETS MORE FREQUENTLY IN ORDER TO FOCUS ITS ATTENTION ON SPECIFIC AREAS. "WE WANT TO HEAR FROM EVERYONE — STUDENTS, STAFF, FACULTY AND ADMINISTRATION — SO THAT WE CAN BECOME MORE KNOWLEDGEABLE ABOUT WHAT'S GOING ON," ELLER SAID.

"THE COUNCIL IS AN ADVISOR TO THE PRESIDENT AS WELL AS A RESOURCE FOR WOMEN ON THE CAMPUS," SAID JOYCELYN HART, ASSOCIATE VICE PRESIDENT FOR HUMAN RELATIONS. HART SERVES THE COUNCIL AS A LINK WITH OTHER CAMPUS WOMEN'S GROUPS AND AS A RESOURCE FOR STATISTICS AND OTHER INFORMATION. "A SIGNIFICANT PART OF MY MISSION IS TO PROMOTE GENDER DIVERSITY ON CAMPUS," SHE EXPLAINED. "I SEE THEM AS A STRONGALLY IN THIS EFFORT."


"THE WOMEN OF THE PRESIDENT'S COUNCIL CAN SERVE AS AN IMPORTANT SOURCE OF REFERRALS TO IDENTIFY PROMINENT WOMEN FOR OPEN POSITIONS," ADDED HART. "THROUGH THE EXPERIENCES AND NETWORKS OF THESE
Women

were many members and friends of the President's Council as by women artists.

women, we can increase the pool of candidates. The Council plans to establish a bank of job candidates by compiling the resources of its members.

“We encourage the appointment of qualified women at all levels of the University,” Eller commented. “I think we’re making real progress. The new controller of the University and the new director of the Biotechnology Center are both women. We’re pleased to see these appointments.”

Eller continued, “I’d like to see absolute parity in women’s participation at all levels in the University. The presence of women in the classroom and in the administration sets a tone for all the people in the University. It’s appropriate to the commitment that Cornell has made for 125 years to diversity.”

In addressing the needs of students, the Council has sponsored speakers, career panels and discussion groups on life choices and what to expect in the workplace. Council members also serve as individual mentors for students and as sponsors for externships, where students can spend anywhere from a day to a week observing their sponsors in their workplaces and learning more about a particular field. Council members are offering 40 externships, which are open to all students in the University.

Said Elise Rosenberg ’93, a student trustee and an ex-officio member of the Council, “I am excited to be involved in the Council that represents women, to find out what the President’s Council does for students.” Rosenberg, an agricultural economics major, is one of the 14 new members who joined the Council this year. She will serve on the campus constituents committee where, she said, “I can have the most input about campus issues such as safety and rape awareness.”

Also concerned with women who have left the Cornell community, the President’s Council wants to draw other alumnae back to the University as members of the Council. Current members will serve two to three year terms, rotating to allow others to join.

Invitations for membership come from President Rhodes himself. The membership committee of the President’s Council accepts recommendations, and forwards its nominations to the President. “We look for women who have reached a level of stature within their chosen professions,” Eller explained.

“We also especially look for women who have not previously been active in the University,” added Eller. “The Council was created as a vehicle to bring additional women to the University, women who have not been very involved. Our purpose is to bring these new women closer to Cornell.”

Landis agreed, “I helped found the Council because I think it’s important for professional women alumnae to have an impact on the status of women at Cornell. The President’s Council presents an opportunity for women who have not been active with Cornell, who have devoted themselves to their business and professional lives, to become involved.”

The Council can serve these women, Eller said, as training ground for higher leadership positions in alumni affairs and throughout the University. “As these women get to know about Cornell again, they will be candidates for Cornell Council, college councils and board memberships,” Hart added.

In meeting its objective of promoting the participation of all Cornell women, the President’s Council is currently raising $100,000 to fund research and project initiatives. The money will be granted for either research on social issues or for project initiatives that focus on work at the University to enhance the experience of students and staff. “We’re offering grants of up to $25,000,” commented Eller. “We hope we can achieve some good with this money.”

Another project undertaken by the President’s Council was helping the University’s Herbert F. Johnson Museum of Art last year to purchase works of art by women artists. The Council raised $15,600, matching a grant given to the museum by the National Endowment of the Arts. With the funds received, the Johnson Museum added four prints to its collection.

“The formation of the Council is a positive step for Cornell,” praised Hart. “We’re very pleased to have the President’s Council as advocates. The number of volunteer hours that these women give is a great gift.”

by Debra G. Birnbaum ’92
HISTORY.

It's what you hold in your hands right now.

In December 1903, the very first issue of The Cornell Countryman was published. In it, George F. Warren, for whom Warren Hall on the ag quad is named, announced the birth of this publication.

"For some years there has been a growing desire to establish an agricultural periodical at Cornell University. Such a publication is necessary in order to keep the former students in touch with each other and with the college, and to present the advances in agriculture. This is the mission of The Cornell Countryman."

Thus the Countryman was born.

Warren intended for the contents of each issue to "deal with the larger problems of country life, the economic and social conditions, the rural school and the farm home." Also of significance were the "results of scientific investigations," as well as "news of former students."

With current readership numbering over 2,600, the Countryman is one of Cornell's longest-running publications. It also holds the distinction of being the only student agricultural publication in the Ivy League, as well as the oldest continuous agricultural publication of any school in the country.

The title "Cornell Countryman" was suggested by Liberty Hyde Bailey in 1903. Even though ten pages of advertising helped pay for the first issue, insufficient funds kept the first issue's cover illustration, featuring a farmer sowing seed, on the covers of the next several issues.

In the beginning, most articles were contributed by professionals and faculty in the agricultural field. The Countryman's earliest credits feature the names of some of the most widely recognized and respected Cornellians: Martha Van Rensselaer, George Warren, Anna Comstock, and Albert R. Mann—all immortalized by the buildings named in their honor.

The Countryman began as an agricultural research journal, but in 1931, students began contributing articles, a practice that would eventually take over.

Only a few years later, Julie Bockee '37, the magazine's first woman editor, shifted the focus of the Countryman away from technical articles. As a result, the covers became more varied, emphasizing black and white photography and original illustrations. This started a tradition that still continues today.

For decades, the Countryman thrived, reaching out to readers with information about agriculture and campus life. But in February 1963, a series of unfortunate events almost sounded a death knell for the publication. In that issue, the editors and staff of the Countryman warned in an editorial that "The Cornell Countryman presently is facing one of the most critical problems of its history... the magazine is suffering from an inadequate staff, a weak financial base, and a chronic lack of support from the student body."

Citing a list of several problems, including vacant positions and lack of advertising, the staff made the following recommendations to the Board of Directors: that the responsibility of the Countryman be assumed by the Department of Extension Teaching and Information (now known as the Department of Communication) and that the publication be converted into an accredited academic course. If these recommendations were declined, the only viable alternatives would be to postpone publication indefinitely or to disband the organization.

Needless to say, both recommendations were put into effect. First the Countryman was adopted by the Department of Communication. Later, producing the magazine became a part of an accredited academic course, Print Media Laboratory. This is how the Countryman is produced today.

The goal of the Countryman is two-fold, according to Jane E. Hardy '53, faculty advisor and co-lecturer for the print media class. The first objective is to teach students how to put out a "real magazine with a real readership." The second objective is to keep readers informed of what's going on in the College of Agriculture and Life Sciences.

Erica Fishlin '93, a Countryman staffer, feels that her Countryman experience has been a positive one. She explains that she "learned a lot about magazines and how they are put together."

Bonnie Zucker '93, also a member of the magazine's staff, holds a similar opinion. One thing Zucker learned from helping to put out three issues a semester is that "There's a lot more work involved in putting together a magazine than I had anticipated." Still, she finds the process rewarding and worth the effort.

"This class is a really good experience for me, particularly because I want to pursue a career in magazines."

In trying to keep pace with the magazine industry and changing technology,
the Countryman, in 1988, adopted a new design, one Hardy calls “more current looking, and better.”

With the arrival of graphic designer Helaine Wasser, the present co-lecturer for the class, this year’s issues have featured a more uniform and consistent design.

As for the future, Hardy foresees the magazine moving slowly toward being produced by desktop publishing. Although she believes that being able to lay out articles on the computer allows students to explore more possibilities and to be more creative, Hardy insists that the Cornell Countryman “will never become a class in desktop publishing.” She says that in the future, “Classes will continue to concentrate on the editing, writing and design aspects of the magazine, leaving the legwork of physically putting a magazine together up to the printer.”

Even though a new class comes in every semester, the quality of each issue has remained steady. Hardy points out recurring themes of articles which have become constants through the years, “Fun, spring semesters, and the career center are all popular subjects, especially for seniors.”

Still, Hardy must make sure each topic is “new and different” in order to avoid rehashing the same old news.

According to Hardy, the Cornell Countryman “reflects a true historical picture and viewpoint.” She said that the articles are written about what students care about, pointing to one example of the political unrest of the 1960s being reflected in the articles of the time.

As the College of Agriculture and Life Sciences evolves, so too does the Cornell Countryman. In fact, Hardy said that “The magazine has had to change to keep up with the College.” She notes that as the principal enrollment of the college shifted from farmers to people involved with production agriculture, home economics, and research, the focus of Countryman articles similarly changed.

Today the main audience of the magazine is primarily composed of alumni, students, faculty, and staff, though a number of issues are sent to high schools and cooperative extension offices.

Kris Petracek ’92, a regular reader of the Countryman, said she picks up her copy of the magazine because she’s “interested in finding out about what’s happening in the ag school.” Though she prefers the “anecdotal” stories to “late-breaking science pieces,” Petracek agrees that the Countryman class is a good experience for everyone. “The Countryman provides a good opportunity for students to see their work in print and write for a specific audience.”

In giving students the chance to see their work in a real magazine, Hardy practices a “hands-off” approach to teaching. That is, she allows her students a wide range of freedom in producing the magazine. Hardy reasons that “I don’t need to learn how to put out a magazine, they do.”

Although she admits it’s an odd approach to running a publication, Hardy said that she wants students to be able to try out new things and to learn from their mistakes. To this extent, she does not even look at the final copy for the magazine before it’s typeset. Rather, she trusts the students’ judgments, sends the articles out to the printers, then sees what happens, what works, and what doesn’t.

In this way, the Cornell Countryman belongs to the class, and it is the class’s responsibility to deliver a good magazine.

The rewarding experience of publication seems to be geared toward students. After 16 years of working with thousands of Cornell students, Hardy explained why she still enjoys being faculty advisor. “Every class is different, which is really interesting. That’s why I like teaching this class.”

The proof is in your hands. ■

by Allan Wai ’93
Beyond the Turquoise Elevator, the Bailey Hortorium

THE TURQUOISE ELEVATOR LURCHES upwards. Its trembling slowness and vibrant color show the age of the building: circa 1950. The doors open on the fourth floor hallway, painted a light yellow-green. Through a door just beside the elevator lies a large room filled with 171 cold gray metal cabinets lined in straight rows. At the other end of the hall lies a similar room, but larger and denser, holding 435 cabinets, some that slide back and forth on tracks to save space. With such surroundings, it hardly seems likely that the fourth floor of Mann Library contains one of the world’s largest collections of native New York state plants, pressed as they will last forever. Or that the world’s largest assortment of seed catalogs dating back to the early 1800s can be found here—in the Bailey Hortorium.

Behind the wooden doors, the Hortorium holds 900,000 pressed plant specimens. These specimens have been collected for nearly two centuries and housed in the Hortorium for several types of plant research. The faculty and staff at the Hortorium concentrate on plants that flower, called seed plants, and ferns, as opposed to algae or mosses. These specimens are helpful in studying the relationships of groups of plants, using state-of-the-art technology like molecular and DNA comparisons and computer programs which determine how closely related a group of plants might be.

Taxonomic research is extremely important. Faculty and graduate students study not only the relationships of plants, but even the naming and classification of plants newly discovered. "Botanists are still discovering new species all the time," said Professor Emeritus William Dress. These new species must be identified, named and classified in relation to other plants. Sometimes plants have been misidentified in the past. Ongoing research puts them in the right grouping with plants they are related to.

But more than research goes on in the Hortorium. Other activities involve interaction with the public. The staff is knowledgeable in identifying plants, and it helps scientists and gardeners with questions about plant identification. People from around the world send in plant specimens to be classified. The questions concerning identification range from the ordinary: "What weed is this growing in my garden?" to the outrageous: "Is this plant an aphrodisiac?" Ed Cope, extension botanist at the Hortorium, occasionally receives the contents of a horse’s stomach. He tries to find the plant parts and identify them to help find out why the horse was sick. Another staff member had to appear in court once to identify the seed that a woman had broken her tooth on while eating at a restaurant.

Just to one side of the elevator in the hallway leading to the smaller cabinetted room are shelves of seed catalogs from companies all over the world that sell seeds and plants through the mail. The Hortorium collections add up to near 130,000, with issues from the 1830s through the present. Gardeners and professionals like landscape architects, nurserymen and foresters can contact the Hortorium to get access to this information, for example, to find the name of a company that sells an obscure species of plant. Historians also use the collection.

Today’s Hortorium is made up of what fifteen years ago was two separate institutions: the Bailey Hortorium and the Wiegand Herbarium. They both began before the turquoise elevator was even thought of. The first collections of the Bailey Hortorium were compiled privately by Liberty Hyde Bailey on his travels throughout the world for his own research. Some of the earliest specimens date back to Bailey’s teen years in Michigan. Bailey came to Cornell in 1888 as the first professor of horticulture. He gathered New York state plants here, later expanded to wider frontiers and traveled throughout the world searching for plant specimens. Many of his specimens were collected during a 6-month trip 1,000 miles into the interior of China in 1917. In 1921 Bailey traveled to Trinidad, Venezuela, and Brazil.

In 1935, Bailey donated his collection to the College of Agriculture. His gift included nearly 125,000 plant specimens, 2,700 books, the building housing these collections and the land surrounding it, including a garden plot. These were located at Bailey’s residence at Sage Place, which still stands south of Stewart Avenue between Seneca Street and State Street, several blocks from the Cornell campus. As a condition of the gift, the University promised to keep the Hortorium facilities at Sage Place while Liberty Hyde Bailey was still alive. The facilities and staff remained there for the duration of his life.

In the early 1900s botany was devoted to wild plants, not the cultivated plants found in the garden, which were thought unworthy of study. Bailey’s views on garden plants were radical for the time. He thought cultivated plants were of equal botanical importance to wild species and tried to move their study forward into the realm of “legitimate” botany. The collection he gave to the University was made up mostly of cultivated plants.

It was reported in Liberty Hyde Bailey by Andrew Rodgers that Bailey coined the term hortorium in 1935, when he donated his collection of plants to the College of Agriculture. This makes the name “Hortorium” unique. Upon accepting the gift, the president of Cornell, Livingston Farrand, suggested the collection be called an herbarium, but Bailey insisted differently.

“Call it an Hortorium,” Bailey said.
“An Hortorium? Where did you get that word?” asked a confused Professor Farrand.

“I just coined it,” Bailey replied. “It comes from ‘Hortus,’ the Latin for ‘garden.’ It is a repository for things of the garden. It is to be a place for the scientific study of the plants of the garden—their documentation, their classification and their naming. That is what my wife and I are giving you. Not just an herbarium.”

Even after donating his collection of plant specimens to the University, Bailey continued to collect specimens from all over the world. He made these travels at
his own expense, but donated the fruits of his travels—the plants—to the Hortorium. His travels took him to Nova Scotia, Cuba, Haiti and throughout the United States. His last trip outside of the country was in 1948—at the age of 90—collecting rare plants in the jungles of islands in the Caribbean. Bailey died in 1954.

Another part of what is today’s Hortorium was the first to be founded, the Wiegand Herbarium This herbarium has its roots in the collections of a young botanist named Horace Mann, son of a famous educator. Andrew Dickson White bought the collection when Mann died from tuberculosis. Mann made extensive collections during travels through New England, Hawaii and Minnesota, (he took the latter trip with Henry David Thoreau). White’s purchase included more than 14,000 sheets of plant specimens. A second herbarium was started by Karl Wiegand, Cornell professor of botany, in 1913. These two collections were combined in the 1920s and made a part of the College of Agriculture. This herbarium was named the Wiegand Herbarium and housed in the Plant Science building.

Both the Bailey Hortorium and the Wiegand Herbarium moved into Mann Library when the building opened in the early 1950s. The Hortorium collections were kept in the large room on the south end of the building, and the Cornell Herbarium collections were located on the north end of the building, where there is still a brass “Wiegand Herbarium” plaque on the wall. Even though the two institutions were housed on the same floor, assistant curator of the Hortorium Bob Dirig said the staff “had such differences in approach, they rarely interacted.” The Herbarium concentrated on wild plants and the Hortorium studied cultivated plants, and both performed individually the same tasks of research and answering questions for the public. They coexisted like this for more than twenty years.

Finally in 1977 the Hortorium and Herbarium combined into today’s Hortorium, primarily to cut down on costs. Each contributed about 350,000 plant specimens. The collections were integrated and filed together, the activities were combined, and the staff was united. The curator of the Bailey Hortorium became curator of the combined units.

Today the Bailey Hortorium adds about 9,000 new plant specimens each year to its collections. At least half of the new specimens come from exchanges with about 100 other herbaria around the world. Dirig explained that when one type of plant is collected, several specimens of it are gathered and the extras are then sent to other institutions. This sharing allows herbaria to broaden their range of plant specimens. Another way the Hortorium gets new specimens is through graduate students’ and professors’ research projects. When people from various departments like botany, entomology and horticulture are finished using their plant specimens, they give them to the Hortorium. The third way the Hortorium gets new specimens is through collections by the staff. Dirig said, “We know the collections well enough to know where our weaknesses lie, and when something is unique and exciting.” He would pick up these missing plants to add to the collection. In fact, several years ago Dirig and Cope noticed a lack of conifer specimens from Allegany County, New York. So they took the opportunity and gathered the needed specimens to fill the gap.

Cornell's Bailey Hortorium is internationally known for several of its collections. The palm collection is one of the two largest in the world. The palms take up 171 cases, nearly half of the physical space in the Hortorium, because palms are generally very bulky, even when pressed. Bailey himself spent much of his life and travels collecting palms and researching their taxonomy. His interest in palms is reputed to have started after teasing from his wife. When he couldn’t identify a palm they saw on a trip to Jamaica, Mrs. Bailey challenged, “I thought you were a botanist.” Thanks to Mrs. Bailey’s off-hand comment, one of Bailey’s main objectives on collecting trips throughout the world was to find new species of palms and to classify known palms, a task at which he was very successful.

Many of the rooms lining the hallway on the fourth floor of Mann Library are devoted to research. Today, the Hortorium is a leader in the field of discovering taxonomic relationships through the use of molecular studies. This is a relatively new way of putting plants into groups and deciding how closely related they are. The DNA of two plants, preferably alive, are compared. If the plants have similar numbers of parts showing advanced traits they are closely related.

The door to the large north room of collections closes quietly. Listening closely, sounds from other doors through the hallway reveal the gentle hum of activity behind them: the murmur of academics discussing research, the thump of boxes containing new specimens being moved, the creak of metal cabinets being opened. The elevator arrives and the doors hesitantly part and close again. From the fourth floor of Mann Library, the elevator begins its descent.

by Kris Petracek ’93
"BURP!"

"But don't excuse me," said the cow, adding that "Belching isn't as horrible a problem as most people perceive it to be."

Bovine flatulence, which produces methane, has been given a bad name by those concerned with the possibility of the greenhouse effect producing global warming.

Some scientists say that blaming cows for producing methane does not reach the major problem—carbon dioxide from electric plants, cars and other sources. Chlorofluorocarbons, popularly known as CFC's, probably contribute to the problem. CFC's are released from some aerosol cans, automobile air conditioners and other sources. Aerosol cans with CFC's are banned in the U. S. but still produced in other countries. Researchers believe that the CFC's contribute to global warming and also damage ozone that protects us from ultraviolet rays. So people, not cows, are really the problem.

Washington State University scientists have produced preliminary results showing that cows do not even produce as much harmful gas as people think. These researchers join a large number of scientists working on ways to prevent potentially detrimental global warming.

Alice N. Pell, an associate professor in Cornell's animal science department, argues that scientists have to dispel the rumors. "First," she said, "people must know more about the facts surrounding global warming.

The earth is covered by a layer of gases that absorbs incoming solar energy. The amount of this energy that is reflected back into space by the earth is, however, determined by the composition and concentration of these gases. Known as greenhouse gases, they include carbon dioxide, methane, CFC's and nitrous oxide.

According to Judy Landers, a Cornell research support specialist in the Global Environment Program, if these gases continue to build up, less solar energy might leave the earth's atmosphere and eventually there could be a human-induced alteration in global climate, most likely manifested as "global warming."
But what's so wrong with that? People could wear shorts more often, right?

Landers said that the effects could be a lot more serious than that. “According to some scientists, the year 2050 could bring an increase in atmospheric carbon dioxide and other gases which they estimate would probably cause the average global temperature to increase between 1.5 and 4.5° Celsius. This could have serious implications for many of the earth's people. Agriculture would be affected, some ecosystems or species may die out, and there could be an increase in natural disasters like floods and tropical storms.”

What do innocent ol' cows have to do with these phenomena? Well, cow belches are made up of both carbon dioxide and methane. Some people advocate changing the type of feed given to cows so that they will burp less. So researchers at Colorado State University are working on new types of feed. Scientists Donald Johnson, Mark Branine and Gerald Ward said that while cows usually eat hay and grass, their diet should be 40 percent shelled corn if people want them to burp less.

Pell said that the amount of methane cows produced and expelled would not be reduced very much even if they ate this new feed. Drastic changes in a cow's diet might affect the quality of the meat.

Vegetarians counter by saying that people don't have to eat meat. Pell responds by noting that not everyone can survive on vegetables alone. And some people cannot grow protein-enriched vegetables like legumes because of unsuitable climates.

Moreover, Pell said that if problems of carbon dioxide and methane production are to be solved, changing animal gas production is not going to make as big a difference as addressing other areas. Sitting in front of pictures of cows in Vermont and a huge portrait of the Mona Lisa with a cow's head, Pell said "People don't want to do what's hard."

Suggestions for solving the greenhouse gas problems, instead of blaming the cows, include encouraging legislators to allocate funds for research to develop CFC substitutes. Furthermore, people could stop producing so much garbage that has to be put in landfills, a leading source of greenhouse gases. Instead of using paper bags at the supermarket, shoppers could use reusable cloth or string bags, and not put vegetables and fruits in clear plastic bags that will be thrown away. But much more important is saving energy.

There are plenty of ways to prevent global warming. Pell said, but everyone wants to blame the cows. Not only that, but Pell said that Washington State University researchers now say that the government and big businesses have been overplaying the amount of methane that cows produce.

Nevertheless, these findings have ignited a new surge of debate on the magnitude of the cow flatulence problem. Scientists say that if the world wants to prevent global warming, people had better stop their own vices instead of worrying about cow belching. Luckily for the cows, they have people like Pell and research teams at Washington State and Colorado State defending them.

Although these scientists aren't leaning cows on their shoulders and putting their backs, they have no objections to them burping.

by Neeraj Khemlani '92
A Classroom Puzzle:

Where

Do

Students

Belong?

STUDENTS IN THE COLLEGE OF AGRICULTURE and Life Sciences pay between $6,000 and $12,000 per year to attend an Ivy League institution, where they expect to receive instruction from some of the most qualified and respected professors in the country. But in many courses, their fellow students are up in the front of the classroom, assisting in the teaching.

At the same time, these undergraduate teaching assistants (TAs) are receiving the unique opportunity of gaining a practical, hands-on teaching experience that they could not get from any textbook or lecture.

This situation raises the question of who really benefits from the ag college's policy to allow undergraduates to be TAs. Who is getting the most out of a deal where students are receiving money or credit for grading papers, holding office hours or leading discussion sections? Is it the undergrad TA, the teacher or the students in the class who reap the benefits from this agreement?

Although faculty members in different departments of the ag college who use undergrad TAs agree that the system works well and provides benefits to everyone involved, disagreement does exist among some faculty over how professors should use their TAs or whether undergraduates should serve as TAs at all.

The ag college is one of the four colleges and schools (College of Human Ecology, School of Industrial and Labor Relations and School of Hotel Management) at Cornell that regularly allow undergraduates to be TAs. According to George Conneman, director of academic programs in the ag college, each department provides for the option of using undergrad TAs by offering a two or three credit teaching course. Students may receive up to a total of six credits for teaching experience. The way TAs are used, however, is left up to the department or faculty member to decide, said Conneman. "It's a very valuable experience. Students go out into the real world and are ahead of people who didn't do it."

Faculty members in the departments of communication, education and agricultural economics said that undergrad TAs profit from the teaching experience.

Cindy van Es, a lecturer for Introductory Statistics, relies on undergraduates and graduates to grade papers, teach sections and hold office hours. "They get a real appreciation for teaching. They learn to be more mature students because they start to understand what goes on on the other side, what a teacher has to listen to," said van Es, who gives her TAs the option of getting paid or receiving credit.

In addition, van Es said that the TAs gain better knowledge of the subject matter and have valuable work experience to put on their resumes.

"For me, the undergraduates are more predictable. They've taken the course, they've graded for the course, I know their personalities. They know my notation. They know how I present things. They know whether they're going to get along with me. They've made a choice to work with me," said van Es. "I never know whether or not a graduate student is going to be good. I've never had it where I've been displeased with an undergraduate."

Agricultural economics major Kathy Amos '92, who is one of van Es's five undergrad TAs this semester said that TAing has improved her communication skills and helped her learn to think on her feet.

Another one of van Es's TAs, Scott Goldstein '92, said the experience of teaching has helped prepare him for his planned career. "It's really been an enjoyable experience. I want to go to medical school, and it has prepared me for working one on one with people," he said.

Senior lecturer Brian Earle '68, MS '71, undergraduate program coordinator and advising coordinator in the communication department, has used undergraduate TAs in Oral Communication, Business and Professional Speaking, Effective Lis-
Erle agrees that the students who are TAs gain invaluable experience.

"When you teach, you're learning the material twice. There's no question that they [students] become much more competent in the subject matter. But more importantly they learn some of their own interpersonal strengths. They become better prepared for job interviews, they have a greater sense of confidence, they generally become better organized," said Erle.

However, some faculty in the ag college disagree with using undergrad TAs. Linda Van Buskirk, a communication lecturer who teaches Scientific Writing for Public Information, Organizational Writing and a communication seminar, said that undergraduates should never be used as teaching assistants.

"I don't believe that anybody going to an Ivy League institution should be taught a substantial amount of the course material by undergraduates. I think people are paying too much money. They deserve people with a full education, not essentially peer education," said Van Buskirk.

The lecturer added that having undergraduates aiding in the classroom distorts the learning process. "It's a falsification of education to put the burden of education on undergraduates. I think it takes away from the experience of the students as a whole. It reduces their contact with people who are farther up on the educational ladder than undergraduate teaching assistants," she said.

Sharing these concerns, some professors in the ag college like R.D. Aplin M.S. '51, PhD '59, use undergrad TAs cautiously. Aplin, who teaches Introduction to Business Management, said that he only uses graduate students to teach his sections because they have the business experience that undergraduates lack. "It's the experience which shows up not only in knowledge and understanding of what we're teaching but also how graduate students have more experience dealing with people and they've had more experience with presentations," said Aplin.

For this reason, other colleges and schools at Cornell, such as the College of Arts and Sciences, do not allow undergrads to be teaching assistants. Lynne Abel, associate dean of the arts college, said, "They [undergraduates] don't usually have the kind of breadth of exposure and knowledge in the subject necessary for leading free-form discussions."

Some students also voiced similar opinions on this issue. Rebecca King '92, a government major in the arts college, said she feels more comfortable with graduate TAs because they have much more experience and commitment to the guidance and discussions about teaching to make it a worthwhile experience. The professor added that he uses his undergraduate TAs cautiously because he does not want to sacrifice the quality of the class for his students.

"The more I give them [the TAs] to do the more I get worried about the students in the course and making sure they both get what they paid for and what they bargained for," said Posner.

Yet Ralph Thompson, senior lecturer and coordinator of the sections for Oral Communication said he firmly believes that undergrad TAs enhance the quality of the class. The teaching assistants in Public Speaking help run sections, grade speech outlines and coach videotaping rehearsal sessions. "I think the undergraduate TA is absolutely indispensable. People look at it as a potential dilution of quality in the course, and I don't think it's that at all. I think if anything, it makes Comm 201 a course that's head and shoulders over most other universities' speech courses," said Thompson.

On the other hand, Van Buskirk said she believes that although the undergraduates may be very competent, the only ones benefitting are probably the TAs themselves.

Both faculty and students, however, said they felt that students in the class profited greatly from having undergraduates assist in the teaching. "Peer instruction has a dimension that you cannot get from supervisory instruction," said Thompson, "The people who are doing the teaching are from the same community as the people doing the learning. They understand their stresses, their problems and know their resources. As students they know them more intimately than a graduate student or faculty member ever could."

Thompson added that by having student TAs, the student-to-teacher ratio is lower than in most classes, and students are guaranteed at least weekly one-to-one contact with another member of the staff. "No student is ever deprived of contact with the professor. It's not a
hierarchal arrangement where you have a distant professor and you have a bunch of peons running the sections," said Thompson.

Students also seem to support having undergrad TAs. Posner said that all of the feedback on student evaluations of TAs has been very positive. "Some students may feel . . . that they're getting short-changed, the blind leading the blind. I've never had an expression of that though," said Posner.

For the four years that van Es has been using undergrad TAs, their average rating on student evaluations has ranged from a 4.5 to a 5 out of a total of five points.

Earle commented that students are much more willing to approach an undergraduate with a problem than the professor. "The TA really becomes a tremendous communication channel between the students and the teacher," he said.

Van Buskirk, however, disagrees that students should even be needed to serve as a link to the professor. "If that's the case then the teacher is not fulfilling his or her responsibilities as a teacher," said Van Buskirk.

Despite the disagreement among faculty, ag college students said they appreciate having undergrads as their TAs because they can relate to students better. "They're more approachable, you don't feel as intimidated. Sometimes they're more understanding. They're more flexible when you have bad crunches," said Pearl Hsu '93, an agricultural economics major.

Julie Armitz '92, a biology major, commented that sometimes undergraduates are easier to understand than graduates. "They're more in tune with what undergraduates' questions may be. They may not be as advanced in their studies and talk above students' levels," she said.

Although there are different views among faculty members, undergraduate TAs may be just what students need in the high pressure environment of an Ivy League school like Cornell. According to Kirsten Johnson '92, a Public Speaking TA, "We're coming more from their level. I know that three prelims in one day is hard. I'm more connected to the normal everyday problems of a Cornell student. I'd recommend it [TAing] to anyone."
Robert E. Moody

Robert E. Moody has just completed his book, “The First Rushville”. Moody graduated from Cornell University’s College of Arts & Sciences in 1918. After graduation Moody intended to be a farmer but the depression forced him to choose a new vocation. He soon became a captivating teacher of world and American history, English, and Latin. He taught for 34 years at the Rushville and Middlesex Valley High Schools and retired in 1962. In 1965 Moody was elected Supervisor of the Town of Gorham. Presently, he is the historian of both Gorham and Rushville.

In his book Moody shares the historical material he has gathered during his lifetime of almost 95 years. He addresses aspects of Rushville life including government, industry, business and the economic influences that took place during the growth of the community. Every organization, including, social, fraternal, service groups and churches is covered with a history of its origin and the personalities involved. The book contains 462 pages and 400 photos and illustrations.

This book will be a resource tool for historians, researchers, and teachers. The author intended this history to be comprehensive and a legacy to the people of the area and to future generations.

Moody and his wife Oneta have spent many long hours during the last six years going through piles of information to complete the book on the history of Rushville.

College’s Experiment Station Making Strides

Cornell University’s New York State Agricultural Experiment Station in Geneva, NY was presented the Lee Hutchins Award for the best research on diseases of fruit crops in St. Louis, Missouri by the American Phytopathological Society. Drs. Roger Pearson and David Gadoury, both members of the Station’s department of plant pathology, were honored for their pioneering work on the powdery mildew disease of grapes.

In St. Louis, Dr. Dennis Gonsalves, a professor of plant pathology at the Experiment Station was named a fellow of the American Phytopathological Society. Gonsalves conducts research on problems involving viruses that attack several fruit and vegetable crops. He is a recognized leader on controlling plant viruses.

Dr. Rosario Providenti, also a professor of plant pathology at the Experiment Station was recently awarded the Meritorious Service Award by the Bean Improvement Cooperative. The award is for outstanding contributions to the production and improvement of beans. Providenti is a world-renowned virologist, known to many as “Mr. Virus.” His work has identified new viruses and resistances to them in many crops.

Other achievements in Geneva include the introduction of two new fruit varieties. They are a strawberry, Seneca, and a sweet cherry named Royalton.

Faculty Achievements

Harlan B. Brumsted, an associate professor of natural resources, was one of two people to be named the state’s Conservationist of the Year by the New York State Conservation Council Inc. and the New York Power Authority. He is a director of the American Wildlife Research Foundation and has worked closely with the state’s Fish and Wildlife Management Board.

Paula Horrigan, a lecturer in Cornell University’s Landscape Architecture Program, has won the Distinguished Teacher Award for Landscape Architects from the National Council of Landscape Architecture. She was elected by her peers for having innovative courses and outstanding student evaluations.

Richard L. Quass, professor of animal breeding, received the 1990 J.L. Lush award in Animal Breeding and Genetics from American Breeders Service, a division of W.R. Grace and Co. Quass was cited as an expert in statistical modeling.

Extension Honors

First Lady Matilda R. Cuomo was recognized for her commitment to New York families and for promoting lifelong health among school-aged youth. She was honored as one of two “Friends of Cornell Cooperative Extension” at a recognition banquet on Jan. 8 during this year’s conference in Ellenville.

Cuomo initiated the “Nutrition For Life” classroom nutrition program in 1984. The teaching materials used have already helped more than 2 million students in more than 4,000 schools develop positive attitudes toward nutrition.

Dr. Helene Dillard, associate professor of plant pathology at Cornell University’s Agricultural Experiment Station, was recently awarded a “Special Citation for Extension Faculty.” The award was made by the New York State Association of County Agricultural Agents in recognition of Dillard’s outstanding contributions to the wellbeing of people in New York and her help and cooperation with cooperative extension programs.
About the Issue

This issue of the Countryman celebrates people helping people, whether through technological expertise, educational advancement or the caring advice of a professional friend. Within these pages professors help biology teachers and aspiring health professionals; an administrator guides students of color; a program educates small business owners; agricultural specialists aid farmers; experts inform consumers on food safety and a professor inspires his students to study the fungal world. The College of Agriculture and Life Sciences continues to be a source of professional knowledge and personal support.

On the Cover:

Designed and illustrated by Melissa Glim. The traditional quilt designs used are, counterclockwise from the top: Schoolhouse; Hens and Chickens; Red Cross; Drunkard's Path.

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Baker noted the occurrence of institutional outbreaks of salmonellosis among the elderly in ing homes and hospitals and the very sick who have weak immune systems. In light of the recent media coverage of salmonella outbreaks, people are wondering if to eat them. Risk factors show that every 10,000 eggs is contaminated even at-risk eggs can to eat if people make them thoroughly and with raw eggs such as cake batters, and eggnog. Proper handling of eggs can keep the chances of salmonella infection in control. Safe practices include washing one’s hands before and after preparing the eggs, using Grade A eggs without cracks or leaks and storing eggs in their original cartons in the main section of the refrigerator. Baker's own studies at Cornell on heat tolerance in bacteria have produced a set of time and temperature recommendations for cooking eggs. Scrambled eggs, he said, should be cooked at 250°F for seven minutes and fried over-easy eggs cooked at 250°F for three minutes on one side and two minutes on the other side. An alternative to fresh Grade A eggs are liquid eggs which have been heated to 140°F for three and a half minutes to kill bacteria. These pasteurized eggs are safe to eat without the fear of salmonella infection.

Baker and his colleagues at Cornell University have performed extensive work related to the problem of salmonella in eggs in New York state. They conducted a survey of New York state egg farms to find the prevalence of S. enteritidis. The study used a sample of 46 commercial egg farms representing over 80 percent of the eggs produced in the state. One hundred eggs from each farm along with the poultry manure and feed were tested for S. enteritidis. None were found in or on the birds' eggs, feed or feces.

Cornell has about 8,000 hens which are free of Salmonella enteritidis and produce up to 4,000 eggs every day. However, many of the eggs produced at Cornell are used for research purposes and do not have a great effect on the commerical market. Food science scholars like Gravani and Baker continue to contribute their insight to the body of knowledge about salmonella in the poultry industry. They hope to dissuade unnecessary panic among the public, but they also hope to heighten public awareness concerning food safety which can greatly reduce the occurrence of foodborne illnesses nationally.

by Cozzette Lyons '92
SMALL FRESHWATER MOLLUSKS WITH alternating light and dark stripes have invaded our lakes and presented a problem of immense proportion.

Like barnacles, zebra mussels attach to most hard surfaces and reproduce rapidly. Females are capable of producing from 40,000 to one million eggs each during a single spawning season. Adult mussels can grow to two inches long and form clusters as dense as 200,000 mussels per square meter.

First sighted in North America in June, 1988, the mussels were probably introduced into our waters through the ballast tanks of European ships. In less than four years, the mussels have spread throughout the Great Lakes and beyond. They were recently spotted in Seneca Lake and the north end of Cayuga Lake.

“They’re spreading extremely fast,” said Michael P. Voiland Jr., associate director of the New York Sea Grant Program at Cornell University. “If it seems like suddenly they’ve arrived, and suddenly they’ve become a problem, it’s because they have. In biological terms, four years is a very short period of time.”

The Sea Grant Program of Cornell University and the State University of New York funds a number of coastal research studies and its extension program at Cornell provides public education on coastal problems like the zebra mussel.

According to Voiland, the yellow-brown mussel is a major headache for water utilities and power plants because it is one of the few freshwater mollusks that attaches to solid objects. Intake pipes at water and power utilities provide an ideal habitat for the mussel which filter-feeds on microscopic plants and algae. Since utilities require a continuous supply of water, the intake pipes offer a constant supply of food.

Over the next ten years, Sea Grant officials estimate that utilities will spend $1.5 billion on the zebra mussel problem. “And ultimately,” Voiland said, “the cost that a power utility or a water utility has to bear to deal with the zebra mussel gets passed down to the user on your water bills and on your electric bills.”

Nationally, Sea Grant has funded between $2 and $3 million in research over the last two years, and some of that money went to professors at Cornell working on the zebra mussel problem, Voiland said.

Currently, chlorination is the most common and effective way of controlling zebra mussels. Anticipating the spread of the mussels throughout Cayuga Lake, the Bolton Point Water Treatment Plant on East Shore Drive in Ithaca, New York, recently installed a small tube within the water intake pipe which releases chlorine, one of the few chemicals known to kill zebra mussels.

While that might seem reasonable since water is normally chlorinated by water utilities, Assistant Professor Samuel Landsberger, in the School of Mechanical and Aerospace Engineering, said treating unfiltered water with chlorine gives rise to potentially carcinogenic chemicals like trihalomethane which is currently on the Environmental Protection Agency’s list of dangerous toxins.

Even though these chemicals have known or suspected bad side effects, Landsberger said the water utilities are essentially telling the EPA, “Either we put in the chlorine or you don’t get any water.”

Landsberger is currently working to build a pipe-crawling submersible device that would inspect and clean intake
pipes colonized by zebra mussels. The project is funded by Sea Grant and the Erie County Water Authority. "The notion is to provide an alternative to chemical treatment so there is a safe way of keeping pipes clean without poisoning the customers," Landsberger said.

The first prototype, which is near completion, weighs about 100 pounds and is roughly the size of a lawn mower. The device uses a high pressure water jet to blast zebra mussels without damaging the pipe surface, and it may include a vacuum to suck up the dead mussels.

The most difficult challenge for the submersible is not removing the zebra mussels, but navigating the intake pipes which may contain a variety of obstacles and sharp bends, Landsberger's goal is to design a mechanical device that is inexpensive, reliable and able to travel great distances under remote control.

Cornell has already applied for a patent on the pipe-crawling device and Landsberger said a large underwater vehicle manufacturer in Canada has expressed interest in producing the device commercially.

Even if such a device becomes a reality, the disposal of dead zebra mussels creates a problem at already overcrowded landfills. Professor Joe M. Regenstein '65, MS '66, of the Department of Food Science, is conducting Sea Grant-sponsored research into the effectiveness of composting dead zebra mussels in the same way you compost leaves in your backyard.

Composting is anaerobic digestion that mixes carbon and nitrogen materials with air and moisture so that bacteria and fungi can live on the decaying material. The end product is a black-brown powder that is used as a soil amendment.

According to Regenstein, composting disposes of zebra mussels in a beneficial way and serves two important functions: it eliminates the odor associated with disposing of dead animals and it takes advantage of the biological resources available in the dead tissue.

In preliminary tests, Regenstein and student assistant Marci Yaremko collected 100 pounds of zebra mussels from a Rochester Gas and Electric plant on Lake Ontario. They conducted two experiments; in the first, they composted mussels just as they were when they removed them from the electric plant. In the second, they composted mussels that were ground up in a hammer mill.

Regenstein said the zebra mussel compost from both experiments would be used as a soil enhancer. "We don't tend to use the term fertilizer because the content of nitrogen is not high enough," he said. Regenstein will conduct other experiments with zebra mus-

by David W. Marston Jr. '92
Cindy Van Es, a Lecturer in the Department of Agricultural Economics, is now at home on medical leave after the birth of her second child. In addition, she will follow that up with a month's vacation, as many mothers do or wish they could do.

Van Es' spring courses were canceled, as they were in fall 1989 when she gave birth to her first child. Said van Es: "If you hire women, that's what could happen." She noted that she teaches her large class, "Introduction to Statistics," every semester as well as during the summer. The course is intended primarily for sophomores and juniors, but if a graduating senior needs to take the class, he or she can take a similar course in the New York State School of Industrial and Labor Relations instead. Van Es said, "Personally I feel kind of bad about missing up someone's schedule, but my department has never been anything but supportive of me."

Van Es is only one of the many women now employed by the College of Agriculture and Life Sciences. Due to the increasing number of academic women making it into the college's final applicant pool, the importance of an accompanying issue is emerging. That issue is what to do when these researchers, teachers, and Cooperative Extension workers have children.

Right now, the policy of the ag college is flexibility. Joycelyn R. Hart, Associate Vice President for Human Relations at Cornell, said that the policy appears to be satisfactory at this time. It has proved so for Assistant Professor Barbara Knuth. Knuth began working in the Department of Natural Resources in the fall of 1986. Like Senior Lecturer Dale Grossman '72 of the Department of Agricultural Economics, Knuth found the chair of her department "agreeable" about her plan to take disability. Knuth had her first child in January of 1990, so she changed her teaching schedule to teach both of her classes the preceding fall; Grossman successfully planned the births of her children for the summers of 1982 and 1987, and taught her scheduled classes the following semesters. Said Knuth, "I don't know if the University realizes that women try to time their lives so (having a child) is the least burden on the University. In what I do professionally, I look for professional justification as well as personal. I say, 'this is why X would be good for the curriculum.'"

The sense that personal reasons alone would not be well accepted as reason for leave, was shared by Carroll Glynn, an associate professor in the Department of Communication. Glynn feared that she would not be perceived as taking her career seriously if she had children: "I felt I had to put more into it, to prove myself." Glynn's feeling is expressed in a cartoon taped to her office door, which reads, "My fear is that somewhere between the mommy track and the tenure track, I derailed." However, Glynn noted that the people in her department treated her first child as their own, and that George Conneman '52, MS '56, Director of Academic Programs in the ag college, announced the birth of her first child in College Curriculum Committee notes.

One possible cause of the derailment feared by Glynn is a concern about good child care. Said van Es, "When you want to have children, you not only have to think about leave, but about what it will be like full-time to have a child." Nina Bassuk, an associate professor in the Department of Floriculture and Ornamental Horticulture, said that peace of mind after having a child "all hinges on whether or not you have really good daycare that you feel good about. I was lucky enough to find really good people. But before that issue was settled, it was a time of high anxiety." Bassuk did not hesitate to call her present good fortune "exemplary of women with well-paying jobs."

Glynn, however, has not been at Cornell for the twelve years that Bassuk has. Hired at the same time as her husband in 1984, Glynn views daycare as expensive. Ideally she would have liked to take longer leaves after her children were born, but with thousands of dollars of student loans to pay off, she could not afford to take a longer unpaid leave. Glynn cited daycare for her two children as costing between $12,000 and $15,000 per year. She was sure to add, "There is less expensive daycare, but you pay the price."

Jane Mt. Pleasant of the Department of Natural Resources estimated that she and her husband, a graduate student in the School of Applied and Engineering Physics, drive fifty miles per day to collect their three children from daycare and elementary school. Mt. Pleasant said that her husband takes on more than fifty percent of their household and childrearing responsibilities. She said that the concept of single parenthood "just staggers me." In addition to the challenge of her job as an assistant professor, she said that "concerns about tenure add to the pressure. Something's got to give; often it's the job."

Mt. Pleasant, who has had two children since she was hired in 1987, has given herself some reprieve by taking a total of one extra year to complete her application for tenure. Elizabeth Oltenacu, Associate Director of Academic Programs in the ag college, said that if a woman academic wants to have children, "the tenure clock can be stopped for a year." Not all women wish to take advantage of this policy: Glynn, for example, said "I don't like it when people say, you can delay a year." It implies you weren't working or doing something." Instead, Glynn chose to get "no sleep."

Mt. Pleasant, however, is back to work after giving birth in October. She took seven weeks of disability and one week of vacation, which she split into two weeks of half-time work. Such flexibility on the part of depart-
ment chairs in the ag college has been crucial to childbearing academic women when adjusting their schedules. "The attitude from the dean on down is that this is part of the nineties, and we make it possible," said Director of Academic Programs Conneman.

Additionally, Oltenacu said that it is important to the College not to give women the burden of working things out. She said that it may be difficult for a new professor to ask for specific consideration because she may feel the need to "play the game by the rules." Therefore, the ag college administration instructs department chairs to initiate discussion with pregnant women in their departments.

By the time a pregnancy occurs, however, most women usually have a plan, and say to their department chairs, "This is what I will do." They feel personal responsibility towards a job in which, as many women said, "You don't have to punch a clock."

Pat Johnson PhD '83 said that it was expressed to her as an assistant professor in the Department of Animal Science that she could work out a desirable plan for herself. She had her child in September 1991, and arrangements were made for two of her colleagues to teach her endocrinology class for the first three weeks of the fall term. At only three weeks, Johnson's leave was unusually short. Usually, academic mothers receive between six and eight weeks, depending on whether or not they need a Caesarean section.

Following that, Johnson brought her daughter in to work with her on Tuesdays and Thursdays, when she worked on her lectures. Johnson explained that her colleagues and department chair were really good to her, and "when Helen Beth cried, I just closed my door."

Susan Riha also had a friendly reception as the first pregnant woman, not to mention the first woman, in the Department of Soil, Crops and Atmospheric Sciences. Said Riha, "In my department, people had no problem, except they were getting nervous," because she worked up to the day her first child was due. She noted that two grad students in her department had babies shortly after her, and even now she talks to women graduate students about when to have a child. "Being in science, it's hard to take time out. There is so much that's ongoing," said Riha.

Associate Vice President for Human Relations Hart agreed that women in the sciences do have special concerns. "Much of research is lab and field driven. We try to make a plan so women can continue their research." Because of this special interest, Riha recommends this strategy of childbearing to graduate students: "Do it when you want to. There's no ideal time. You're always busy. If you put it off for too long, you may regret it.

"Get the environment you're in to adjust to you. People will be reasonable, when they actually see it happening, if they see more and more women doing it," said Riha.

by Gretchen Leigh Metzger '92

Helen Beth Johnson is a quiet companion to her mother, Pat Johnson '83, as she works in her Morrison Hall office.
SOMETIMES EVEN TEACHERS NEED to take a seat in the classroom.
Recent developments in the biological sciences have left many high school biology teachers behind. While advances occur at Cornell and throughout the research community, New York state high school biology teachers remain shackled by a 24-year-old syllabus that emphasizes memorizing hundreds of definitions rather than applying broad concepts.

Crippling budget shortfalls have severely limited funding for high school laboratory supplies—the average biology teacher is allotted only $5 per student each year. Many teachers, especially those in rural areas, are finding it harder and harder to keep up.

But an outreach program developed by Cornell University’s Division of Biological Sciences is giving some New York state teachers the tools and inspiration to overcome these obstacles. And so far, the teachers are more than rising to the challenge.

The Cornell Institute for Biology Teaching (CIBT) invites high school biology instructors working within a 100-mile radius of Ithaca to attend a three-week summer program on the Cornell campus. Funded entirely by grants, CIBT is designed to help high school teachers catch up with recent advances in biology through lectures, workshops, field trips and innovative take-home lab exercises designed for direct transport to the average high school classroom.

“Our eyes were opened to how much [the teachers] need updating,” said Peter J. Bruns, director of the Division of Biological Sciences. “They are well behind the times. But they soak in information up, they’re great.”

High school teachers who have participated in the program said CIBT has helped re-invigorate their attitude toward teaching. “The take-home labs have a new approach, new flavors and new ideas,” said Mary P. Calvord, a CIBT participant who has been teaching biology for 22 years.

The average CIBT participant has been teaching biology for 17 years, said Rita Calvord, who coordinates the program and teaches in CIBT’s molecular biology sessions. “Molecular biology has practically been invented in the last 17 years,” she added. Other areas in which teachers need updating are evolutionary and behavior theory, Calvord said.

Not only do teachers return to their schools with new knowledge, but they also receive three Cornell credits, funds to purchase laboratory supplies and a Macintosh computer and modem. Teachers use the computers both as teaching aids and as a direct connection to other CIBT participants and Cornell.

The computer network and semi-annual “reunions” nurture a continuing relationship between the teachers and the University.

CIBT offers two summer programs, one in molecular biology and one in evolution, ecology and behavior. Each program accepts 20 applicants.

The learning does not stop when the teachers leave Ithaca. Many CIBT participants meet with other teachers in their school or district to pass on the new information and take-home lab exercises. “We try to find teachers who are intellectually alive and who we think are leaders in their schools or communities, so they’ll share the say, ‘They [the Cornell faculty] will think we’re all a bunch of dummies.’ But everyone we’ve had contact with has been great.”

High school teachers in the evolution, ecology and behavior program, funded by the National Science Foundation (NSF), receive $1,000 to purchase laboratory supplies for their schools. Participants in the molecular biology program, funded by the Hughes Institute, receive $2,000. This money allows teachers to buy previously unattainable lab equipment and supplies.

For example, Calvord said, the CIBT funds have allowed her to expand her lessons with gel electrophoresis—a technique used to separate DNA molecules on the basis of their chemical and physical differences. “On a regular high school science budget, you have to buy your frogs and worms, and that eats up
much of that [funding],” she said.

Nancy V. Ridenour ’65, the former president of the National Association of Biology Teachers and an Ithaca High School biology teacher, was among those who helped Cornell develop the program.

Ridenour, who has taught biology for almost 20 years, said the labs were pilot tested and rewritten several times before the first summer’s program. “We really wanted to make them tight so there were not a lot of gaps that students wouldn’t understand,” she said.

So far, the take-home labs are popular with both teachers and students. Labs range from a slug behavior lab, where students collect and name their own slugs, to an “earthworm disease” lab, said Sherri A. Foote-Huth, a CIBT participant who has been teaching biology for six years. Foote-Huth credited the program with energizing her approach to teaching. “It’s easy to get burned out,” she said. “It’s very hard to keep up on all of the latest things on your own.”

One of the most successful parts of the program has been the electronic computer network linking the teachers to teachers who are interested in updating their knowledge and are willing to sacrifice three weeks of their summer vacation. Uninspired teachers who do not have the energy or desire to improve their teaching methods often stay home.

“That’s a problem,” Bruns acknowledged. “But, O.K., let’s help the good ones for starters.” By targeting the “good ones” and encouraging them to share information with their colleagues, many more teachers can be enriched, he added.

CIBT’s future depends on the availability of funding. A $1 million grant from the Hughes Institute supports the molecular biology program until 1994 and a $465,000 NSF grant will see the evolution, ecology and behavior program through 1993. A grant from Apple Computers, Inc. provides the Macintosh computers.

Future NSF grants depend on the availability of government funding. The Hughes Institute is currently developing plans for the next phase of its grant initiative and will take into account current Institute awardees, such as Cornell, along with other colleges and universities eligible for the Institute’s grant program, said Stephen A. Barkanic, the Hughes Institute’s program officer for undergraduate education.

“I think it’s very difficult to teach science well,” Barkanic said. “Many students have already turned off to the sciences by the time they get to high school. But programs such as this can begin to turn around some of the preconceptions the students have toward science.”

In addition, CIBT and the New York State Department of Education have jointly applied for a NSF grant to completely revamp the state’s high school Regents Biology syllabus. The syllabus was last overhauled in 1968 and has since undergone only slight adjustments, said Bruce R. Tulloch ’68, an associate in science education at the New York State Department of Education.

Much of the material in the current syllabus is outdated and, Bruns said, some of it is simply incorrect. “The reality of the scene is that the teachers need a tremendous amount of updating and the resources going to the schools are fairly inadequate,” he said. “We’re trying to create continuing help to make sure it’s not a one-shot deal.”

by Jill Rackmill ’93
Taking Care of Small Business

"JUGGLING TWELVE BALLS AND wearing six hats while walking a tightrope in a windstorm over a ravine full of crocodiles and having to smile and say, "Business is great!" is how Sydney Scott Tyler, associate director of the Personal Enterprise Executive Education Program, describes owning a small business.

According to Tyler, of the estimated 700,000 small businesses begun nationwide each year, approximately 50 percent will fail after the first year.

Frequently, small business owners begin their ventures before mastering basic business principles: "I regularly hear about businesses started in a base- before they make costly mistakes.

The program is unique in that few other institutions offer a concentrated business curriculum outside an undergraduate setting. Many state organizations, like chambers of commerce and certain government agencies, do offer assistance and brief workshops; however, this widely scattered range of resources may be too confusing for small business owners. "When trying to locate assistance, a small business owner often feels like a pinball in a pinball machine," Tyler said.

Another unique feature of the program stems from the fact that few other business programs concentrate on small Fortune 500 companies. "The other 98 percent of all businesses are small businesses, and they have an educational need which is increasing," Hudson commented. "In the future, I think we'll see more and more small business development."

Tyler agrees: "Clearly, there has been a window of opportunity for a long time. Most small business owners are just trying to survive, so they look to educational institutions for help."

The Executive Education program consists of three major parts: home-study modules, three-day workshops, and one-week seminars.

According to Tyler, the home-study modules will allow small business owners to learn in their homes and at their own pace. "My typical experience with small business owners is that they don't have the time to go to a college credit course because it doesn't address their specific needs," she said.

The modules will be mailed to participants, who will send their homework assignments back to the Executive Education program to be graded by management and business students. They will initially be available in print format, and may eventually be available in audio, video and computer formats. Newsletters and one-page fact sheets will accompany the modules. Participants will receive a certificate after they complete the home-study course.

Tyler added that the modules will be product oriented: "Everything that the small business owners do will be a product that they can use in their businesses.

"For example, in the first module, 'How to Start a Business,' the product will be a business plan, and they will have that ready to take to a banker or accountant." Thus, the participants will be doing more than just theoretical "homework": their assignments will have real-life uses as well.

Dr. Michael Hudson, Director of the Personal Enterprise Program.
The three-day workshops will address more specific issues, like marketing, high technology and export opportunities, Tyler said. Hudson hopes the workshops will spread nationwide. The week-long seminars will also concentrate on small business issues, but will examine them in more depth, Tyler said.

The home-study modules will be available in the fall of 1992, the seminars and workshops in 1993, Tyler said. She added that so far responses to the program have indicated strong support. “People essentially say, ‘When can I order it?’” Hudson sees the program as a natural extension of the ag college’s mission. “As a land grant institution, we have a mission to serve the population. In an agrarian society, the first entrepreneurs and small business people were farmers. There are a lot of analogies between running a small business and running a farm.”

Executive Education also complements the work of the Personal Enterprise Program, which currently offers three undergraduate courses in business. In addition, the Personal Enterprise Executive Education Program sponsors internship and mentor programs, as well as an annual spring Forum, in which successful entrepreneurs describe their businesses.

Hudson compares the mission of the Personal Enterprise Executive Education Program to the story about teaching a person to fish—if you give a person a fish, you feed him for a day, but if you teach him how to fish, you feed him forever.

“Because demand is so big and so overwhelming for service in this area, the best the few people can do out there is throw small business owners a few fish,” Hudson said. The Personal Enterprise Executive Education Program, however, can actually teach small business owners how to fish. Hudson added, “We want to teach people to be better business people rather than to solve their problems for them.”

by Jennifer Perillo ’93

From left to right: Dr. Michael Hudson, David Zalaznick ’76, and College of Agriculture and Life Sciences Dean David Call, supporters of the Personal Enterprise Program.
FOR IMMEDIATE RELEASE:

Ag PR Gets Top

"PUBLIC RELATIONS IS THE ANALYSIS of a situation between people, institutions or groups of the public with a view to improving the situation. A public relations man is a sort of go-between, a contact between commercial enterprise, or any enterprise, and the general public." Edward Bernays, the father of public relations and the honorary editor of the Cornell Countryman, wrote these famous words in 1952. Today, they have meaning for three Cornell graduates who work together in one of the most successful agricultural public relations firms in the country.

Mark Monroe ’77, Steve Werblow ’88 and Steve Harbula ’91 all graduated from the Department of Communication and are now co-workers at the GrowthTech division of Gibbs and Soell, Inc.

GrowthTech is one of the Gibbs and Soell offices that handles agricultural public relations. Because this division of the agency specializes in agriculture, it has a relatively small staff in comparison to other Gibbs and Soell offices. The agency is located outside of New York City in White Plains, New York. Gibbs and Soell has five other offices in major cities across the country. GrowthTech may be the agency’s smallest division, but it is one of the largest in terms of success. Together with the other five offices, GrowthTech contributes to Gibbs and Soell’s standing as the number one agricultural public relations agency in the United States in 1991.

The use of the Cornell Career Center and the communication department’s internship program aided each Cornellian in finding his place on the team at the agency.

Monroe, currently vice president of the GrowthTech division, recalls that his experience in a communication class, “Print Media Laboratory” with senior lecturer Jane Hardy ’53, inspired him to pursue a career in agricultural journalism. After the career center informed him of an agricultural public relations opening with Gibbs and Soell, he sent a resume, interviewed three times and then landed a position as junior account executive. Over the years, his success and ambition have earned him the position of vice-president.

The position brings a diversity of responsibilities for Monroe. As head of the office he is in charge of making important managerial decisions, along with planning programs and budgets for clients. One of the things he still enjoys most, however, is researching, writing and editing materials for agricultural and environmental clients. "Another extremely satisfying part of my job is hiring bright, hard-working people and watching them develop and grow as professionals," Monroe said.

Werblow acquired his position with Monroe’s assistance. Eleven years after Monroe graduated, he received a resume from Werblow. The agency was expanding and needed new talent. Werblow was a strong applicant and was hired as a junior account executive; he has since been promoted to account supervisor. His main responsibilities include writing feature articles for agricultural publications, organizing publicity at trade shows for clients and, more recently, producing educational videos about soil conservation techniques for farmers.

Harbula, the most recent Cornellian to join the team, graduated in the spring of 1991. He started with the agency in June 1991 as a junior account executive and has already been promoted to account executive. In 1988 the agency created an internship program in cooperation with Cornell for students interested in agricultural public relations. Harbula was Cornell’s first GrowthTech intern at Gibbs and Soell during his winter break senior year. After the internship, he received a phone call in the spring of 1991 from Monroe asking him to interview for a permanent position. Harbula won the position and now plays an important role in implementing programs for clients. "Even though I've only worked for the agency a short time, my knowledge of agricultural business has increased tremendously. I've really enjoyed working with the companies we represent and also with the farmers who use their products. I'm always eager to learn more," said Harbula.

The agency performs many different functions and provides varied services for its clients. One of its largest accounts is ICI Americas Inc., one of the largest producers of agricultural crop protection products. The agency helps formulate and communicate company positions on issues—soil conservation, environmental impact, and pest resistance, for example—that can affect product sales. The agency also does straightforward communication of product benefits.

GrowthTech uses as many channels of communication as possible: feature articles, press releases, educational videos, manuals, brochures and newsletters. The agency even put food safety and environmental messages onto a dinner-style placemat to be used at company-sponsored meetings for customers.

Agricultural products are scientifically
complicated and their potential effects on the environment are an increasing concern. The employees of GrowthTech have become knowledgeable about the environmental effects of products to communicate product information accurately. Monroe believes that the agency must acquire an in-depth understanding of each product, farming technique or company they promote. "I think that is one of the reasons there are so many Cornell graduates in this office. A good agricultural background is necessary," he said.

Another challenging aspect of agricultural public relations is the target audience. Most farmers are highly educated about the products, the soil they are used on and the environmental issues surrounding them. "We're working with a very sophisticated customer. The farmer views his or her purchases as both a business person and a consumer, so we need to work on both a business level and the emotional or ethical level," said Werblow.

One may think that the only task of the agency is to publicize products to farmers in hopes of increasing sales, but this is not true. As environmental issues in farming become increasingly important, the agency strives to inform its audience of the environmental impacts associated with product use.

One example of the agency's involvement in environmental issues is its program to educate farmers about conservation. The United States government passed the Conservation Compliance Act, which states that any farmer with highly erodible soil must implement a conservation plan by 1995 to remain eligible for most government programs. GrowthTech is informing farmers about the advantages of different conservation plans.

Much of the work the agency does benefits not only clients and farmers, but also educates the public. "It is important that the public become more educated about agriculture and the environmental issues facing it. Many Americans hear the word chemical and assume that it will be harmful to the environment. However, agricultural chemicals can help a farmer's crop yields without hurting our natural resources. Farming is vital to our economy and it is important that we educate the public about it," said Werblow.

The agency divides into teams when working on different accounts. The small size of the GrowthTech division allows the entire staff to take an active role in projects; everyone contributes to meet all of the set objectives. Because of the non-hierarchical structure of the office, there is mutual respect and friendship among them. The similar educational experience Monroe, Werblow and Harbula share also enhances office atmosphere. "It is nice to work with other alumni. Having a common alma mater has been an important bond we share. Along with sharing memories of Cornell, we all have had a similar education, and respect that about each other," said Werblow.

The Gibbs and Soell agency, and the GrowthTech division in particular, is not only growing but continually making new strides in agricultural public relations. Edward Bernays would be proud.

Mark Monroe '77 works diligently as vice president of the agency.

Steve Werblow '88 busy in Nebraska doing field work.

Taking time out from his busy day, Steve Harbula '91 smiles for the camera.

by A. McKiegan '93
According to a recent national trend, the answer may soon be “Yes, more than ever!” Experts say that the recession-proof aura surrounding health careers has redirected many would-be lawyers, MBAs and other professionals to medical school, and has therefore increased the competition for spaces in medical schools.

Cornell students are no exception. Since 1984, the number of Cornell students who apply to medical schools has increased by nearly 60 percent, said Laurie W. Myer, supervisor of Cornell’s Health Careers Evaluations Committee (HCEC). Now, more than ever, Myer said, Cornell premeds need to maintain a sharp competitive edge.

Since 1950 the Committee has helped Cornellians put their best foot forward for medical and dental school admissions committees. Despite its name, the HCEC never meets collectively. Its members work as a loose affiliation under the University Health Careers Program Advisory Board.

How much does the HCEC really help premeds? According to Myer, the Committee has maintained an 85 to 95 percent acceptance rate for the students it evaluates and recommends to medical schools, in contrast with a 50 percent acceptance rate for students who apply independently.

The secret of the HCEC’s success lies in its simple purpose. “I think the philosophy has always been to be helpful,” said Professor Emeritus Donald W. Cooke of the Department of Chemistry and former chairperson of the HCEC. The help available for premeds was very limited back in the 1930s when an advisory committee was first formed for students in the College of Arts and Sciences. A major difference in today’s Committee, Cooke said, is that it now also involves the College of Agriculture and Life Sciences.

Statistics from the University Health Careers Office in 203 Barnes Hall reveal the HCEC’s broad spectrum. Myer said students in the ag college comprise 30 percent of the 400 premeds registered with the 1992 HCEC. Although most are juniors, some of the applicants are seniors and others are upper class transfer students.

But even more diverse than the premeds are the HCEC interviewers themselves, Cooke said. The 1992 HCEC interviewing team is comprised of approximately 105 professors, emeriti and University Health associates—about half of whom are ag college affiliates. While some carry degrees in scientific disciplines, others have little or no scientific background.

The HCEC’s new chairperson since October 1991, Professor Emeritus Jean R. Robinson of the Department of Consumer Economics and Housing explained that the HCEC welcomes interviewers from non-scientific fields because the students’ science mastery will be proven to medical schools by their grades and standardized test scores.

“We’re not trying to say ‘This is a good science student.’ We’re looking for interviewers who are interested in students,” Robinson said.

The students first meet the Committee interviewers during the preliminary interviews which start in mid February. Prior to these “blind” interviews, the interviewers receive no information about the premeds other than their names.

Professor Emeritus Arthur A. Muka PhD ’54 of the Department of Entomology, whose daughter interviewed with the HCEC and was accepted to medical school in 1984, said the blind interviews encourage students to do some soul searching without forcing them to discuss their grades or work experience.

“The first interview is designed to really get to know the student. We’re really delving into our understanding of how they answer questions, how they think,” he said.

The blind interviews, he said, aim to establish the students’ motivations for choosing careers in medicine and to unearth their opinions about medical practice and ethics. Muka talks with the students about socialized medicine, inner-city health care, AIDS and other important topics.

Muka said the students reveal things that are relevant beyond grades; they often disclose personality traits that can shape their futures in medical school. To him, the most impressive premeds show a sense of perseverance.

“Medical school is a very long, tedious and difficult program,” he said. “I always ask myself ‘Will this person burn out easily?’”

Despite the introspective nature of the interviews, Muka said he always tries to put the students at ease, a lean-back-and-tell-me-the-story-of-your-life ap-
Prescription for Success

proach, which he said has paid off for both sides.

Sometimes the interviewers are surprised by what they learn, especially those who are not usually in contact with premed students. Professor Emeritus Douglas J. Lathwell of the Department of Soil Crops and Atmospheric Sciences said the premeds he has interviewed differ from his own students by their generally earlier "career focus." The common impression of the "cut-throat," egotistical crowd Thundering off to medical school, however, seemed unfair to Lathwell after he got to know the premeds.

"The students are a very interesting group," he said. "They are very bright; many of them are extremely sincere in wanting to go into the medical profession."

On the flip side, the HCEC interviewing process is designed to inform the premeds as much as the interviewers, said Dale A. Grossman '72, a senior lecturer in the Department of Agricultural Economics.

Interviewer feedback to the premeds is especially important during the more formal "informed" interviews which occur in April. To prepare for these interviews, Grossman receives each student's academic transcript and extra-curricular record along with the blind interviewer's written observations and the student's personal essay about medical school.

Grossman and the students discuss any problems which show up during the informed interviews, such as erratic grades or lack of health-care experience. She said this confrontational approach helps the students prepare for their medical school interviews later in the year.

Grossman said she tries to be frank with the students whom she feels are not ready for medical school. On the whole, however, the premeds she has interviewed are excellent students who often underestimate their own achievements.

Aside from a chance to give feedback, the informed interviews are also a way for Grossman and the other HCEC interviewers to integrate the students' various qualities and form a rounded image of their preparedness for medical school.

After the interviews are over, the informed interviewers compose the first drafts of the HCEC letters of recommendation. When finished, the letters complete the application packages which Cornell sends to the medical and dental schools upon the students' written request as part of the admissions process.

Professor Peter C. Hinkle of the Section of Biochemistry and Cell Biology in the Division of Biological Sciences, said the Committee recommendation letters help bypass the student complaint that professors usually do not get to know them well enough to write meaty comments that impress admissions offices. The Committee letters Hinkle drafts are in fact able to supplement the students' credentials with a reasonable amount of detail.

Because of their specificity, the Committee letters of recommendation require a lot of time and teamwork, Myer said. As soon as the drafts arrive, Chairperson Robinson and the Health Careers Office collaborate to write recommendations that best emphasize each student's assets. Robinson gives final approval to the letters. Although the HCEC tries to accommodate every student's personal circumstances, Myer said, the Committee letters are generally formatted, edited and signed by September. They are then filed with additional letters of recommendation from professors and research supervisors.

The 1992 application packages will be mailed to 25 domestic and foreign schools for each student, for the $120 application fee.

According to Grace Agnetti, assistant dean of admissions at Cornell University Medical College in New York City, the HCEC packages have traditionally impressed the Medical College as a credible form of feedback from the applicants' teachers and advisors.

The HCEC system pays off for both admissions committees and applicants, Agnetti said, because complete recommendations substantiate the clinical experience, good academic performance and strong motivation—all factors that medical schools rely on to admit new students.

"Usually Cornell students do well in the application process," she said. "Of the 1991 class of 101, we matriculated 18 students from Cornell. The year before we matriculated 24." These are good statistics, she said, if you consider that the 1991 class came from 46 different undergraduate institutions.

The students' success is not simply Big Red favoritism or selective applying, Agnetti pointed out. According to last year's data, Cornellians also did well in their acceptance rates to other prominent medical schools. Furthermore, Cornellians have had to compete with scores of top premeds for the 101 seats, she said. Since October 1991, Cornell Medical College has received 4,700 applications for the class of 1992.

Susan Green '92, a communication major, said the Cornell support does make a difference. After speaking to applicants from other colleges at her dental school interviews, Green saw that the swarm of applicants had frightened advisors at other institutions into discouraging aspiring health professionals.

"When I came to the advising office as a junior, all I had under my belt was a half-year of biology, a half-year of chemistry and a year of calculus," she said. "I sat down and said I wanted to go to dental school. The advisor just said O.K. and mapped out a plan for me."

Green said despite the high fee required to send letters of recommendation through the Committee, she felt the process was worthwhile and encourages other aspiring health professionals to use it for their admissions search.

"It's an emotional process," she said of applying to dental schools. "It's nice to have people who know exactly what to do if you need help with it."

Her words echo the philosophy behind the HCEC's commitment to students and reiterate the proud feeling that fuels its continued success at Cornell.

by Jill Steuer '92
I

AMINE THAT JUST BY following a properly balanced diet from birth, we could grow up faster and start our ‘real’ lives sooner. Children could go through childhood quickly, saving parents money on baby-sitting costs; start college sooner, avoiding inflated tuition in later years; and begin working earlier in life, earning enough money to be self-supporting.

Of course, we know this scenario is unrealistic. Good nutrition and diet are important, especially in our growing years, but they cannot achieve those results—at least not for humans. Young cows, or heifers, on the other hand, can be grown faster and start their productive lives sooner with the right diet, at a considerable savings for dairy farmers.

Current research at Cornell University’s Department of Animal Science aims to accomplish just that goal.

First, researchers have to convince farmers to pay more attention to their heifers. “Heifer management is a neglected area,” said Corwin Holtz, MS ’86, a lecturer in dairy management at Cornell. “When you look at the performance records, in the last 12 years, we have basically made no progress. We have certain goals for weight and age at first calving, and we have not met these goals or changed them.”

Raising heifers is an expensive aspect of dairy production, and farmers should carefully consider a heifer’s age and weight at first calving as a means of reducing costs. In New York state, raising a heifer costs a dairy producer about $1.42 a day, according to research by Dr. B. F. Stanton and Jason Karszes of the agricultural economics department at Cornell. The average age in New York at which a heifer calves and starts lactating or producing milk is 28 months. This means a heifer will cost about $1,200 before a farmer can start making money from its milk.

However, a heifer’s weight largely determines its reproductive readiness. If a heifer can gain weight faster, it can calve sooner and produce milk earlier. But the process is not that simple—past research shows that rapid weight gain can harm mammary development. As a result, heifers that gain too much weight too quickly may produce less milk. Rapid weight gain can also lead to fat heifers, a problem known as over-conditioning. On the flip side, many heifers are underweight at calving. Low body weight leads to lower first lactation because the heifers are still using their nutritional energy for growth.

To maximize milk production and profit, a target goal has been determined: heifers should begin calving at 22 to 24 months and weigh between 1,200 and 1,250 pounds after calving. If farmers can get heifers to calve at 24 months, they can save about $200 on each heifer.

How can farmers get heifers to calve sooner without affecting milk production and how can they do it economically?

Michael Van Amburgh, a PhD student in dairy science at Cornell, is one of the people trying to answer that question. Van Amburgh intends to define and balance protein and energy requirements so heifers can calve at 21 months, even earlier than the target goal, without harming milk production or producing over-conditioned heifers.

Van Amburgh scrutinized the data that said heifers could not be grown at rates that would harm their mammary development. “I decided that physiologically the studies were right, but management-wise and nutritionally, they were not right,” he said. “If we increase energy, we probably have to increase protein. Protein quality and source may have an effect on how efficiently the heifer uses both energy and protein.” Also, feeding energy to the level required and not beyond is the key to success, he added.

Dr. David Galton, professor of animal science and Van Amburgh’s advisor, said “Because of lack of research and information, many farmers have not tied together growth and the quality of
protein in relation to energy requirements." Farmers can increase the amount of energy heifers get from feed by providing the right amount of microbial protein, and by tailoring the protein content to the heifers' amino acid requirements, he explained.

So far Van Amburgh has been feeding heifers to achieve three different growth rates; the highest rate is set at an expected gain of 2.2 pounds per day. The heifers have been close to meeting their expected rates of weight gain; some are growing even faster. However, Van Amburgh is only about halfway through the five-year-long study and has not seen any major effects yet. Whatever the results, he said, "I would like to get farmers to know their heifers more intimately. Usually, it's a case of management by neglect."

If successful, his program will decrease the cost of raising heifers, feed costs, and number of heifers needed on a farm. The new diet will not affect milk quality or have an impact on milk consumers, Van Amburgh added.

The main change will be a better quality diet than farmers traditionally give to their heifers. However, the more expensive protein-tailored feed will not ultimately raise costs for farmers. Galton said, "We have economics in mind. Profitability is driving this project. On a per pound of weight gain basis, the cost is about the same as the traditional program."

Dr. Dan Fox, professor of animal science at Cornell, is also working to improve heifer growth economically. His research has focused on pasture grazing and the development of computer models to predict heifer requirements, performance and profits on a particular feeding program. He found that with an excellent rotation system, heifers can be grown on pasture to calve at 24 months and 1200 pounds. He estimated that by using pasture, a producer can save about $220 in feed costs for each heifer.

To maintain high quality pasture, Fox recommends that farmers divide pastures into enough paddocks so heifers can be moved to a new part of the pasture every three to four days. The farmers should then rest the grazed pasture for about three weeks in the spring and six weeks in the fall. Heifers should be put on pasture when the grasses are six to ten inches tall and removed when the stubble is about two to two-and-one-half inches high. With a protein supplement, either soybean or fish meal, Fox's research heifers gained weight even faster.

"The biggest problem," said Fox, "is learning how to do it. I don't think it's difficult once a farmer makes the commitment to it. A number of farms are using it successfully. It fits the resources of the New York state hill and valley dairy farm very well." Because the New York grazing season lasts only five or six months, he said, producers also need a good winter feeding system.

Galton added, "A manager has to be really good to make this system work. It's very intense, and it's difficult to do with a large number of animals. But if done correctly, heifers can be grown more economically."

Ultimately, the most profitable system depends on feed, labor, and management resources on the farm, said Fox. His group has developed a computer program, called Cornell Cattle Systems IV, which considers all these variables and can be used to evaluate feed requirements and costs on alternative feeding programs.

Van Amburgh's and Fox's research reflect the relatively recent movement to increase awareness of the importance of heifer management. The Department of Animal Science and Cornell Cooperative Extension have launched an educational campaign aimed at agri-business people—extension agents, veterinarians and animal feed suppliers—and their clientele, the dairy producers.

"The information was well-received," said Holtz. "The audience got some numbers and information that they felt comfortable taking back to the producers and saying 'Let's consider this.' If even only a few of the audience members did this, we accomplished our goal."

The symposium was only the beginning. The animal science department has worked with PRO-DAIRY, an extension program, to develop a heifer management curriculum to teach producers. The curriculum was completed in the winter of 1991, and Holtz thinks it will make an impact. "It's going to take time to change and see the results. But from my travels and contacts, I've seen more of an awareness," he said.

Most important are the dairy farmer's responses to the information. "Dairymen are independent," said Van Amburgh. "They don't have to listen to what we say."

Tim Dye, owner and manager of Dye's Farms in South Dayton, New York, which has about 120 cows and 120 heifers, was favorably impressed by the research. He already uses a rotational grazing system, but not to its full advantage.

"Rotational grazing is practical if you have enough available land for it," he said. "I know people who have used it very successfully with their milking cows, and they are happy with the system. If my pasture land weren't so wet, I would be willing to try it with my heifers."

As for calving at 21 months? "Holy cow!" Dye said. "I would have to see more evidence. It sounds good and seems like it would be profitable. If it's a simple matter of balancing rations, it's well worth trying."

by Dana Nigro '93
Village with a Vision

AT A TIME WHEN THE EARTH'S resources are disappearing, a group of progressive Ithacans are working to set things right. With environmental concern and social harmony in mind, the members of EcoVillage at Ithaca are designing a new way to live.

EcoVillage at Ithaca will be a carefully designed community that aims to make the most efficient use of land and resources in a supportive social atmosphere. With help from the College of Agriculture and Life Sciences, residents will work together to formulate innovative techniques for building, managing resources and farming. At the same time, the project will serve as a model and experimental station for others to learn about alternative ways to use the land.

Joan Bokaer, of the Center for Religion, Ethics and Social Policy (CRESP) at Cornell, was inspired to start the project when she learned about a large scale community, Arcosanti, that is currently being built in Arizona. She was struck by how the Arcosanti community could alleviate the current waste of resources in the world by holding on to open space. She saw that by clustering housing and businesses, people could keep otherwise lost land for growing food.

Jennifer Bokaer, who is working on the EcoVillage at Ithaca’s agriculture committee, noted that her mother, “. . . felt we needed a fundamental shift in the way we live in terms of what is best for the environment and what is best for people. The two really go together.” So in the spring of 1991, Joan Bokaer put the word out and started planning a community in Ithaca.

"It made so much sense, I thought we should be building this way everywhere,” Joan Bokaer said of the EcoVillage. In fact, a number of these communities are being built across the world. In Denmark, people have utilized the more efficient clustered housing neighborhood concept to build several hundred “co-housing” communities. In the United States, at least three such villages are functioning in California, and an additional 100 are being planned across the country.

The EcoVillage at Ithaca will combine local business, agriculture and housing clustered into close pedestrian-only “neighborhoods” containing about 25 to 30 households each. A “common house” in each neighborhood will provide a meeting place for lectures and group dinners, laundry facilities, workshops and other services. In this way, the village will operate with a minimum of destruction to the land while accommodating the residents’ need for both privacy and a sense of community. According to Jennifer Bokaer, families spanning three generations have expressed interest in living at EcoVillage at Ithaca.

“It’s a perfect place to raise kids. It’s also great if you are single, or older—you can live within a community, but still be as independent as you want,” she explained.

The common link between each neighborhood will be the EcoVillage policies. EcoVillage at Ithaca will act as a sort of land trust to ensure that the founders’ ideals and policies are continued in the future. These policies, which concern building, agriculture, resource management and educational and economic goals, will be agreed upon by everyone involved. Jennifer Bokaer is confident the brainstorming of ideas currently taking place will lead to an exciting alternative approach to living. She noted that, “One of the most interesting things is that everyone has their own vision. We have enough commonalities to make it work.”

Many of these great visions haul from Cornell students and faculty. In fact, one of the reasons EcoVillage planners chose Ithaca was the tremendous amount of technological and intellectual expertise the University could offer. Students of Ronald Beckman, associate professor of design and environmental analysis in the College of Human Ecology, spent the past fall designing common houses for the neighborhoods. Meanwhile, students in “Hydrology and the Environment,” a course taught by Dr. Tammo S. Steenhuis in the Department of Agricultural and Biological Engineering, will spend the spring of 1992 examining the soil and water on the proposed site to make more detailed geological maps of the land than are currently available.

EcoVillage planners chose Ithaca for another reason—the availability of 177 acres of undeveloped farmland only a mile from downtown on Route 79. The proximity of the land to town—it is even on a bus route—alleviates the complications of long commutes to and from an obscure place. Since EcoVillage at Ithaca will be a model, its creators feel that it should be accessible to the town and the academic institutions. John Smith of the EcoVillage’s agricultural committee noted that, “EcoVillage is to be a demonstration of a more responsible way of living. We want it to be replicable. We don’t expect it to be a utopia; it should be something that can work and others can do too.”

A vital aspect of EcoVillage at Ithaca is the alternative use of the land. The group hopes to keep as much land as possible open for farming, nature reserves and recreation. Smith mentioned the importance of “earthkeeping,” a way of integrating people’s lives into the natural systems in the best way possible. To do this, the EcoVillage at Ithaca’s agriculture committee is actively exploring a variety of farming techniques that would be efficient, economical and environmentally sound.

Community supported agriculture (CSA) is one of these alternatives. The CSA set-up allows a farmer and the community to join together for a group-to-group exchange. The residents become “shareholders” who support the cost of running the farm—and get shares of the harvest in return. This way the community shares both the rewards and the risks of running the farm.
EcoVillage at Ithaca is considering using permaculture to create an integrated agricultural system. All the elements, such as plants, animals and soil nutrients interact to support each other.

Another system the agriculture committee is examining is permaculture, or “just good farming,” as Smith described it. Permaculture is a process by which people design and create a whole agricultural ecosystem. The different elements in this technique are interrelated and thus support each other to a degree. For example, Smith described an orchard in which chickens feed—eating grass, bugs and fallen fruit, thus reducing competition and disease for the trees while fertilizing the soil and producing quality eggs and poultry. Smith and Jennifer Bokaer feel there are many practical ways to cut waste and reduce the amount of work for the farmer.

Creative management of waste products is a major concern for EcoVillage at Ithaca. According to Patrick Walkinshaw, an EcoVillage at Ithaca committee member, the group is looking at ways to “close resource loops” by using waste products for fuel and fertilizer. Smith pointed out that, “Many things [people] think of as waste can really be useful.” For example, by first breaking down wastewater using natural systems, nutrients can be used as fertilizer on hay fields, while animal waste can be used for gardens. Methane can be used as fuel for cooking and farm vehicles.

Walkinshaw described some of the different wastewater treatment systems the group is studying, such as using aerated tanks with floating aquatic plants. In another system, designed by Dr. William J. Jewell, professor in the Department of Agricultural and Biological Engineering, wastewater runs through greenhouse marshes, in which microbial action cleans the water without chemicals. According to Walkinshaw, these systems conserve energy and cost less, while improving water quality to levels comparable to conventional treatment plants.

Members of EcoVillage at Ithaca are working hard to make this community a reality. Financing is an issue because they must pay higher prices up front for systems that will be more efficient, cost-effective and environmentally sound in the long run, while maintaining their commitment to affordable housing and social equity. In order to meet these goals, EcoVillage at Ithaca is actively looking at ways to fund the project, including seeking out grants, and using economical building supplies.

As to whether these ecovillages will spread throughout the country, Jennifer Bokaer affirmed, “It’s definitely the way of the future—it has to be. People have to change the way they live; they have to change the way they live with the environment and the way they live with each other. And if we can do both of these things at once—that’s really great.”

by Melissa Glim ’93
ARE YOU SEARCHING FOR A NEW hobby that is creative, inexpensive and satisfying? If your answer is "yes," consider learning to brew your own alcoholic beverages. Homebrewing beer is easier than you may think. What is more, the beer you make could be the best you'll ever taste.

The processes of homebrewing are so basic, said Dwight Beebe, a homebrewer and postdoctoral student in plant biology, that "If you can boil water, you can make beer." For Beebe, homebrewing is a way to combine his background in biochemistry with his interest in cooking, which can result in some strange brews like the pumpkin ale Beebe created in October of 1991. Steve McLaughlin vet '91 agreed. "It's a creative outlet. The nice thing is you can put anything you want in it," he said. Though McLaughlin likes to experiment with putting fruit in his beer, he said that one can make good beer with simple ingredients.

The four critical ingredients in beer are water, malt, hops and yeast. German beers contain only these ingredients, as mandated by an ancient law, and the homebrewer can create many varieties of high-quality beer simply by varying the amounts of these ingredients.

The process of brewing is easy to master. Assistant professor Jean Hunter instructs an agricultural and biological engineering course in which students brew beer in a simple lab experiment to learn about enzymes and the fermentation process. A brewer's first step is steeping crushed malt in water to produce a sugary liquid called wort. Hops are boiled in the wort to preserve, clarify and add flavor and aroma to the beer. Yeast consumes the sugars in the wort to produce ethanol and carbon dioxide when no oxygen is present, Hunter explained. This initial fermenting process takes about a week at room temperature. Next, the brewer adds sugar to the young beer, fills bottles while taking care to avoid exposing the beer to air and allows the beer to condition for a week. Conditioning is the process by which carbonation is created when remaining yeast ferments the added sugar. The last basic step in beermaking is to allow the beer to age for several weeks.

Homebrewing became legal in the

**Something's Brewing in the Basement**
United States for anyone of drinking age in 1978, said Therese Goddard, who, with her husband Bob Goddard, owns the Summer Meadow Herb Shop in Collegetown. The Herb Shop is the only local supplier of homebrewing equipment and ingredients. Goddard pointed out that the difference between her products and the end result lies in the beermaking process itself. The Summer Meadow Herb Shop does not sell alcohol; the ingredients are food products until they are brewed.

Goddard said she became interested in brewing 11 years ago through a friend's suggestion that the shop carry homebrewing supplies. She said most of her customers are introduced to homebrewing through friends and attributes a recent increase in sales to word-of-mouth publicity about the merits of homebrewed beer.

Why is homebrewing becoming so popular these days? One benefit is that it is cheaper to brew your own beer than to buy it. A basic equipment set-up costs about $50. After the initial investment, the only cost is that of purchasing ingredients. Goddard said that the cost to produce a batch of beer (about 54 bottles) ranges from $13 to $25. That's a cost of 25 to 50 cents per bottle, compared with 65 cents for an average bottle of commercially brewed American beer.

More important for some is the difference in taste. "I think the quality far surpasses anything you can buy," said Dwight Beebe. "I don't make beer because it's cheap. I dump a lot of money into my ingredients and equipment." Beebe extends his enthusiasm for, and knowledge of, homebrewing through his involvement with the Ithaca Brewers' Union, a club of about 90 area homebrewers. The Brewers' Union meets once a month to taste brews, share recipes and discuss methods. Beebe said about 30 percent of the members are affiliated with Cornell, either in graduate studies or faculty positions.

Beebe co-founded the Union two years ago when he came to Ithaca from the University of Wisconsin, where he had been a member of a similar club. Beebe's brewing roots go back to 1983, when, as an undergraduate, he learned about homebrewing through a friend. Since then, Beebe has experimented with changes in ingredients and brewing technology. Subsequently, his cost per batch of beer is higher than most brewers' costs.

Beermaking is a craft with many levels of involvement and the membership of the Brewers' Union reflects it. Members range from beginners with no equipment to those who are "over the edge in terms of technical weirdness," according to Beebe, who counts himself among the latter group. He and other members even grow their own yeast. Members share their knowledge through the "Adopt-A-Brewer" program, in which novices are matched up with more experienced brewers to learn the tricks of the trade.

Though beermaking is an ancient skill which relies on a natural process, the past few years have brought a revival of interest in homebrewing. Goddard attributed the growing popularity to awareness through word-of-mouth by enthusiastic brewers. "Most people don't realize they can make beer on a home scale until they come into contact with someone who does," Goddard said.

Dwight Beebe offered several explanations. The first is the overall improvement in the quality and variety of ingredients available today, which results in better-quality beer. The second is the economic success of brewpubs and micro-breweries. The third is "a tendency in society to want to recapture the good old days. Before Prohibition there was a brewpub in every town," Beebe said.

Whatever the reason for the revival of homebrewing, homebrewers find the practice of the ancient craft creative and satisfying. Some things, including homebrewing, never do change.

by Jeanne A. Naujeck '92
TO STUDENTS OF COLOR, CORNELL'S College of Agriculture and Life Sciences may seem like an intimidating environment, but Catherine Thompson ’81, Associate Coordinator of Student Services, is making it a friendly one.

Amid the blur of administrative paperwork, the mad dashes for course selection and the never-ending demand of scheduled meetings, a student of color can find refuge in the office of this Cornell graduate. Thompson, known as Cate to her associates, has been working in the ag college for nine years and is the only full-time professional person of color in her department.

As a past undergraduate in the ag college, and a woman of African descent, Thompson can relate to the problems that students of color are experiencing today. “Having enough money to attend Cornell was always a concern,” said Thompson, “but my fit as a Black female was also a concern. You lose your anonymity as a Black student here [Cornell University]. It was hard being the only Black person in a classroom. I know what that is like.”

Thompson has had a history of being involved in ag college activities dating back to her undergraduate years. “I got involved in ag-related clubs,” said Thompson. She served as an Ambassador and a Minority Student Advisor, where she participated in the recruitment and counseling of students of color. With this valuable experience at her disposal, a year later she became COSEP Associate for the College of Agriculture and Life Sciences. COSEP (Committee on Special Educational Projects) offers financial, academic and career counseling for students of color.

As a COSEP associate, Thompson must convince every student of color that “ag is do-able.” In major universities such as Cornell, students of color often slip through the cracks. But Thompson serves as a role model and assures that “the ag school is held responsible for the student of color population.”

All the COSEP associates meet weekly, bringing together different experiences to solve common problems, such as students’ academic difficulties and low motivation. Thompson sometimes consults with Janice Turner, COSEP Associate and Assistant Dean of the College of successfully graduate students of color,” and she has taken it to heart. Thompson visits high schools, churches and other community meetings where she advises students and their parents on how to get a college education, whether it be at Cornell or elsewhere. Thompson also advocates on behalf of, and votes on, every folder concerning students of color in the ag college—that includes African Americans, Latinos, Native Americans and Asians.

Thompson’s role as Associate Coordinator of Student Services has changed over the years to allow her more flexibility. She is not only counseling students, but also making policy decisions, which will have an impact on the lives of students of color. Thompson is working with all ag college departments to make sure that students of color are taken care of and well received. “If a department has no students of color, which is still true today, then I take a look at that department to see what going on there,” said Thompson. Nicole Harris, a senior majoring in the Department of Education said, “She was very helpful throughout all four of my years at Cornell.”

“I’ve felt very welcome here,” said Thompson. Establishing a friendly relationship with students is so important to Thompson that she often ventures away from her desk into a dining hall or library just to talk to students of color and find out their needs. Regardless of whether she is in the admissions office or Student Services, Cate Thompson is an example that hands-on involvement can make a difference in the lives of students of color at Cornell.”

by Rey A. Hollingsworth-Falu ’92
MOST STUDENTS STUDYING THE LIFE sciences (and even those who aren't), can tell you a great wealth of information on the plant and animal kingdoms—the producers and consumers in the living world. However, very few can reveal the secrets of the fungal kingdom—life's decayers. Can it be that we have a cultural bias against death and decay, choosing instead to study the more "beautiful" forms of life? Will students always stay away from the mysterious rotten world around them? Not according to the people in the Department of Plant Pathology.

The department was overwhelmed with Cornell students' interest in its new two-credit course, "Magical Mushrooms and Mischievous Molds," introduced in the spring semester 1991. Now in its second semester, class enrollment is near 200. Professor George William Hudler attributes the popularity of the course to the fact that, "People in general are curious about the natural world around them and are often put off by the high-tech science courses. This is a low-tech and low-stress class to encourage students to take a first step into this obscure world." Peter Mullin, a teaching assistant for the course, pointed out that "There is a growing interest in plant disease agents and mushroom cultivation. We see more and more edible mushrooms on the market now than we did a few years ago."

Most classes in the College of Agriculture and Life Sciences focus on either animal or plant biology. The other kingdoms, protista, monera and fungi, are not studied much in lower level courses. According to Hudler, "We wanted to expose more people to what plant pathologists do, but we needed a good way to show that. That's what this course is about." Mullin added, "I hate when people walk around campus and kick mushrooms. It shows the lack of fungal knowledge in our culture. Mushrooms are interesting and fun. This class gives people a chance to see another side of biology they normally do not see."

"Shrooms," the course nickname coined by many students, is different from many other biology courses taught in the ag college. The class consists of lectures and demonstration/discussion sections. Lecture topics are taught in a non-threatening way—one does not need two years of biology to understand the material. The topics are interesting and directly related to everyone's own experiences with the world. They include fungi as decayers of matter, as pathogens of plants and animals, as sources of food (such as cheese) and as mind altering chemicals (such as ethyl alcohol and LSD). Hudler is a great fan of fungus and brings his excitement and enthusiasm to the lectures. Chris Botnick '93 took the course in the spring of 1991 and recalled, "I like the way Professor Hudler relates the material through personal stories and episodes. The lectures are always entertaining and a good learning experience."

"Much of this stuff does not sink in until you actually see it in person; that is why we have demonstration sections," Hudler said. "I also don't like to teach a class of two hundred people and not meet any of them. This is a great way to meet my students." In these sections, students get to view a variety of different fungi ranging from the microscopic species to the much larger ones. Students can even raise their own pet slime molds if they wish. Demonstrations on beer, wine and food preparation are the most popular sections and the last day of class features a feast of edible mushrooms and beverages prepared by the staff.

Hudler became interested in fungi as a senior at the University of Minnesota. After years of floundering around in different majors, he decided to take a course in forest pathology and soon found his passion for the fungal world. He worked part-time studying tree diseases and continued on to get his Masters degree in plant pathology at Minnesota and then his PhD in plant pathology at Colorado State University.

Hudler currently teaches "Pathology of Trees and Shrubs" and "Plant Disease Diagnosis" in addition to "Shrooms."

During a lecture in spring semester 1991, Hudler stated his love for fungus. "I am one of the few people who gets excited when I see a completely dead tree." Students are beginning to develop the same appreciation for fungus that Hudler has. Zack Rabinor '93 said, "I never realized the importance and influence that fungi have on our lives. This class has opened up a new world for me." Though the plant pathology department has no follow-up course planned, Hudler suggests that those interested in decayers look into "Field Mycology," "Introduction to Mycology" and "Introduction to Plant Pathology." For those students who have not yet taken "Magical Mushrooms," Hudler expects to add more visual aids to the lectures using slides and movie projectors, and to write a textbook for the course.

by Jadam Kahn '92
Ag Awardees

G. David Blanpied of the Department of Fruit and Vegetable Science won the Golden Apple Award for his research on controlled atmosphere (CA) storage for apples. Blanpied's work has led to improvements in CA storage technology, which preserves apple quality even after months of storage. The award, presented to Blanpied by the Western New York Apple Growers Association and the New York Cherry Growers Association, praised his work for its importance to the apple industry.

Wheat and grass research won David L. Grunes the title of Senior Research Scientist for 1991. The U.S. Department of Agriculture's Agricultural Research Service presented the award to Grunes for his work with grass and wheat pasture tetany, a magnesium deficiency disease that affects cattle and sheep. The title recognizes Grunes, a professor in the Department of Soil, Crop and Atmospheric Sciences, as the top senior scientist in ARS's North Atlantic Region, which includes 12 states.

Paul Eberts, an associate professor in the Department of Rural Sociology, won an Innovator Award from the New York State Association of Counties. Eberts earned the award for his organization of the Social Trends and Outlook Conference, which allows academics and practitioners to discuss racism, welfare policies, child abuse and other issues.

Phoning in for Felines

Pet owners, veterinarians and others with cat curiosities can now have their questions answered over the phone, thanks to a consulting service provided by the Cornell Feline Health Center in the College of Veterinary Medicine.

The hot line, officially known as the Dr. Louis J. Camuti Memorial Feline Consultation and Diagnostic Service, is the only telephone service specializing in feline health research and education. From 9 a.m. to noon and 2 to 4 p.m. eastern time, Monday through Friday, callers can dial 1-800-KITTY-DR to speak with Dr. James R. Richards.

Questions frequently center around infectious diseases or behavioral problems. When Richards, a doctor of veterinary medicine, cannot answer a question alone, he consults with one or more of the 25 faculty members in the veterinary college who are affiliated with the Feline Health Center. Answers are also available through experts at the Cornell-based New York State Veterinary Diagnostic Laboratory.

The service will answer simple questions free of charge; more complex inquiries, those that require consultation or diagnosis, cost $25.

Assistance for Rural Areas

A new Rural Alliances Initiative developed at Cornell targets unemployment and decreased standards of living in New York state's rural areas.

The Initiative unites Cornell Cooperative Extension with regional planning agencies and county-level government associations. Together, they will provide educational and technical assistance to local government officials and other community leaders. This assistance will help rural areas evaluate their economic standing and develop improvement plans.

Delano Visits Campus

Photographer, film-maker, composer, illustrator, designer, broadcaster and educator Jack Delano visited campus from February 16-29 as the A.D. White Professor-at-Large.

Delano, whose sponsors included the Department of Communication, gave a public lecture, “Art for Goodness Sake: Politics and Development in Puerto Rico.” Delano was born in Russia and studied art at the Pennsylvania Academy of Fine Arts but has lived in Puerto Rico since 1946. His Smithsonian exhibit, “Contrasts: Forty Years of Change and Continuity in Puerto Rico,” is on a three-year national tour. Delano has used his talents to promote social change and development in Puerto Rico, and to portray Puerto Rican culture.

Delano was general manager of Puerto Rico’s first television station, an important figure in Puerto Rico’s rural development program and one of its earliest film directors and producers.

International Economy

An international agreement between Cornell University and the Universidad Nacional Pedro Henriquez Urena (UNPHU) will foster closer links between educational institutions in the U.S. and Latin America. The agreement, established between the Departments of Natural Resources at Cornell and UNPHU, the major private university in the Dominican Republic, concerns ecological conservation and sustainable development. Both UNPHU and Cornell will advance ecological concerns by supporting student and faculty exchanges, training programs and collaborative interdisciplinary research efforts. In addition, both institutions will develop mutually supportive graduate curriculum development efforts.
About the Issue

Spring is an exciting period for students, faculty and staff at the College of Agriculture and Life Sciences. This issue of the Countryman is dedicated to springtime and everything it has to offer. This spring brings a change in elm trees as well as a new listening device for bird enthusiasts. Art also brings change in this issue accompanied by the changing face of the 4-H program. The issue also features the Big Red Barn, changing biology, sheep births, the ecology versus the economy and some underwater indicators. Returning to the spring theme, we lighten it up with a piece on losing weight for springtime and finish with commencement ceremonies.

On the cover:

Artist Jack Delano captures the beauty of the Puerto Rican landscape in his 1981 photograph “Early morning in the valley of Cayey, Puerto Rico.” Delano, known for his talents as a photographer, educator, broadcaster, filmmaker and community developer, is profiled on pages 12 and 13.

Picture Credits:


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Shades of the Past

CORNELL HAS UNDERGONE NUMEROUS changes in the past 40 years, but perhaps none have drastically affected the beauty of the campus so much as the death of its 800 elm trees. Majestic elms once graced the campus from Central Avenue to the ag quad, making Cornell the “once most beautiful university,” as described in A Century at Cornell published by The Cornell Daily Sun. But the elms fell prey to diseases that have all but wiped out the American elm—Dutch elm disease and elm yellows.

It is more fitting to speak of Dutch elm disease as an epidemic because it infects and decimates whole populations of trees, including Cornell’s once magnificent arbors. George Hudler, associate professor in the Department of Plant Pathology, said that the disease was first identified in this country in Ohio in 1930. The particular outbreak which hit Cornell is thought to have originated in New York City, one of the first major disease centers in the country, Hudler said.

Dutch elm disease spreads rapidly from tree to tree. Agents of infection are the native and European varieties of elm bark beetles, which spread the fungus Ophiostoma ulmi through their habit of breeding in already weakened or diseased elms, said Hudler. Emerging from the wood loaded with spores of the fungus, newly-matured beetles then fly to healthy trees to feed and deposit their deadly cargo.

The beetles affect only certain varieties of elm trees. Of those, the American variety which grew at Cornell is the most susceptible to the disease. Almost every American elm that is exposed to O. ulmi dies from Dutch elm disease, Hudler said. Infected trees can be saved, but the disease must be detected early. Often infected branches must be removed, and the tree must be treated with fungicide and insecticide to kill the pathogen and control the beetles, said Hudler. The most important step is to remove all traces of affected elms from the area so beetles are deprived of a ground to mate and pick up O. ulmi.

Some of Cornell’s elms were killed by another disease, elm yellows, which was first identified in the United States during the 1800s. According to the Cooperative Extension leaflet “Dutch Elm Disease and Elm Yellow,” yellows is distinguished from Dutch elm disease by its cause, mycoplasmalike organisms, and by its method of transmission, the leafhopper. Leafhoppers become infected with the yet- unidentified pathogen by feeding on the phloem of leaf veins of infected trees. They disperse as adults to live in and infect healthy elms.

Elm yellows spreads more slowly than Dutch elm disease and is localized geographically. Symptoms of yellows may occasionally be halted with antibiotic injections, but there is no permanent cure. Unfortunately, the American elm is susceptible to both diseases, and Hudler said that the tree is not likely to survive much past the shrub stage.

Robert Mower ’56, PhD ’61, a professor in the Department of Floriculture and Ornamental Horticulture, was on campus when the last elm died in 1977. He said that the American elms disappeared within a frame of about ten years and the only trace of them on campus today is a few seedlings. Though some European and Asian elms show greater resistance to elm diseases, Cornell’s American elms have been replaced by zelkovas, elm relatives, on the arts quad, and by many different tree species on the ag quad.

But the grace and majesty of the American elms have not been replaced. Time and technology will tell if the elm will return to campus in a more disease-resistant variety. Until then, the elm will be remembered nostalgically for making Cornell the “once most beautiful university.”

by Jeanne A. Naujeck ’92
"IT'S LIKE BINOCULARS FOR YOUR ears." A riddle? Not exactly. Brian A. Fenner, a manager with the Cornell University Traffic Bureau and part-time inventor, has created a device that provides people with a new way to hear birds singing. He and other business-minded Cornellians are now watching the outcome of a business plan based upon a simple premise—enhancing the nature lovers' experience can spark profitable enterprise.

Back in 1988, Fenner built the first prototype of his NatureSong™ remote nature transmitter device to sell to bird enthusiasts. Fenner's invention was an electronic box which could be installed near a feeder to send outdoor bird calls into FM stereo receivers in people's homes, much as a radio station transmits music.

Fenner said his device presented a neat solution to an old problem. When watching their feathered friends, bird-lovers often must remain trapped behind windows and walls, cut off from the symphony of calls which birds produce at outdoor feeders. "NatureSong™ brings the outdoors indoors for people—it's a whole new experience," Fenner said.

Fenner's idea first took shape at Cornell's Laboratory of Ornithology in Ithaca. There he noticed the microphone system through which the bird calls from the outdoor feeders enter the laboratory's indoor viewing room. Fenner decided to consult the experts at the Laboratory to help him determine the best technical design for his device.

"I heard the birds outside the glass through their hardwired system. I thought something similar could work inside my own house," he said.

Robert Grotke, a sound engineer at the ornithology laboratory, said he and others at the laboratory have consulted with bird researchers across the world regarding sound recording devices, but Fenner's grassroots project was unique for the laboratory.

"He [Fenner] approached the Lab of Ornithology to work jointly to develop something the Crow's Nest | the Laboratory's nature shop and catalog would sell. We suggested several different types of microphones for his device," Grotke said.

According to Grotke, the laboratory sound technicians advised Fenner to use microphones which could resist the rigors of weather year round and also be sensitive enough to pick up wanted sounds without transmitting background weather noises that could interfere with bird calls.

Grotke said Fenner's device had to be frequency fine-tuned to accommodate the many facets of bird sounds. "Bird song is very demanding," Grotke said. "Birds sing over a wide range of frequencies. Their singing starts with a rapid impulse, and they can produce different tones simultaneously. Birds can also be very elusive. You can't tell a bird to aim at the microphone."

According to Fenner, the current microphone system is a gem. "When I first hung it next to my bird feeder, I could hear birds' wings fluttering, seeds snapping in their beaks. You can distinguish a crow from a robin with the device, a cardinal from a jay," he said.

Once installed outside, the battery-operated device transmits bird calls to FM receivers located up to 50 feet away from the box.

Armed with a solid technical design, Fenner turned next to the Cornell Research Foundation Incorporated (CRF), which had helped patent some of his past inventions, to help develop the device. "Development of NatureSong™ took a lot of time and money," Fenner said. "I couldn't have accomplished it without the help of the CRF office."

Richard Cahoon, assistant director of CRF, said Fenner's invention caught his eye for its potential marketability and the inventor's passion behind it. But, Cahoon said, he and Fenner both knew that the device's commercial development needed to follow a clear-cut marketing strategy.

"We didn't call the shots—Brian did," Cahoon explained. "We [CRF] had a supportive, advisory role in commer-
Great INdoors

cializing the invention.”

Cahoon met with the director of CRF to discuss Fenner’s device. The design was too obvious to win a patent, Cahoon explained, so they focused on developing Fenner’s invention as an original, high-quality device, not a toy.

“It was a marketing problem, pure and simple,” Cahoon said. He explained that while inventions do not always need patents to be successful, market position definitely matters—an invention should enter the market ahead of similar products in order to establish recognition among consumers.

Cahoon first analyzed the market for Fenner’s invention and discovered that upscale nature catalog businesses seemed promising. He and Fenner then sent promotional information and photos of the device to potential customers.

Cahoon said he and Fenner also discussed ways to improve the device’s market attractiveness. “Brian’s version was ugly, but it worked,” Cahoon said. Wood housing was much better [cosmetically] for the device, but I told Fenner to maintain the highest quality in the electronic guts of it.”

After trial and error, Fenner created the final high-quality cedar wood box, which included a rust-proof solid brass screw-eye for hanging and a plastic inner casing to protect the parts from weather damage. The device’s “facelift” also included a new name, which Cahoon himself coined. Fenner and CRF filed for a trademark in the summer of 1991; NatureSong™ is now Fenner’s logo.

Cahoon explained that CRF takes special interest in helping industrious inventors like Fenner to develop and market their ideas—ideas which range from new chemicals to lasers, superconductors and new varieties of grapes and apples.

Following CRF’s development help, NatureSong™ was next taken on by Michael Hudson, director of the Cornell Personal Enterprise Program which is housed within the Department of Agricultural Economics. Cahoon told Hudson about Fenner’s new device. Hudson then worked with Joseph G. Zonin ’91, a student in his small business course, to help Fenner develop a solid business plan.

“Brian came into my personal enterprise class to speak about his device,” Hudson explained. “Joe selected it to work on. Brian’s big question was how to get it into the marketplace. Joe was able to draw on his knowledge and experience to help Brian come up with a business plan.”

Zonin researched the nature catalog and retail store business to identify and reach potential customers. Under Hudson’s supervision, Zonin drew up a business plan, which Fenner then applied to his distribution company which handles NatureSong™.

According to Hudson, NatureSong™ presented some unique challenges to himself and Zonin, due to its high quality workmanship and $179 retail price. “It’s a costly device,” Hudson said of NatureSong™ “The cost positions it in a very restricted market.”

Another question, Hudson added, was whether a second cheaper version of the device would be profitable. “Use was a difficult issue to address,” he said. “We tried to exhaust alternatives to get a sense of where it could go.”

Aside from valuable help to Fenner, said Hudson, the project gave Zonin a chance to apply his education to tackle the types of marketing problems that face real-life business entrepreneurs.

Fenner said although NatureSong™’s sales suffered a delay due to the wait for Federal Communication Commission approval (just granted in January 1992), the coming year promises good business.

“I’d like to sell 500 units this year,” Fenner said. “It depends on my contacts.” His strategy includes finding a sales representative to introduce NatureSong™ to retail stores throughout the east coast. He also hopes to place the device in a Maryland store owned by The Nature Company in May 1992.

Debbie Wood, an employee at the Crow’s Nest, said she plans to purchase the device for her elderly mother, who cannot see well, so her parents can better enjoy the birds at their feeder. “It picks up the birds fairly sharply for its price,” Wood said. “It’s easy to install and pick up on the radio station.”

Wood said she herself has heard a variety of birds with the device. In fact, she hopes NatureSong™ will help her detect the tiny, elusive warblers’ seasonal return to the ornithology laboratory.

Whether or not profits will return for Fenner’s company as surely as the spring birds, Fenner said that he and his family will continue to enjoy the two NatureSong™ transmitters installed in their own home. “I get personal pleasure from it,” he said. “I just click the stereo button on and listen to the birds.”

by Jill Steuer ’92
THE MOST APPROPRIATE DESCRIPTION of 4-H in 1992 would be “head, heart, health, hands...and change.” Cornell Cooperative Extension has been making exciting changes in its 4-H curriculum.

“The program is no longer limited to teaching kids how to milk cows and cook,” said Marcia Eames-Sheavly ’83, extension support specialist in the Department of Fruit and Vegetable Science at Cornell University.

Donald Rakow MPS ’76, PhD ’87 and Joann Gruttadaurio ’73, MPS ’78 both work in the Department of Floriculture and Ornamental Horticulture. All three are members of the 4-H Plant Science Curriculum Development Committee at Cornell. This committee works with Cooperative Extension agents from around the state developing programs and goals for 4-H. Eames-Sheavly, Rakow and Gruttadaurio specialize in programs dealing with plant science and natural resources.

The three have made an effort to introduce programs which will give 4-H members and other youth a more in-depth understanding of science and how it applies to their lives. The latest programs are more complex than some of the older ones. “Our newest programs have the children doing fun projects which also teach them about other cultures, new scientific discoveries and their environment,” said Eames-Sheavly.

“The Three Sisters” is a new project Eames-Sheavly is implementing this year. 4-H members and other children will learn how to grow corn, beans, and squash which comprise the three sisters in Iroquois culture. However, the program does not stop there. The students will also learn about the cultural importance of corn to the Iroquois. Customs and stories, which evolved in the Iroquois culture while planting the three sisters, will be discussed. Eames-Sheavly is hoping that the children will realize the importance of agriculture in the establishment of the Iroquois culture.

“The Three Sisters” also introduces the children to the concepts behind the importance of plant breeding and genetic diversity. “This program goes beyond just teaching the kids how to plant the seeds. It teaches them about another culture and ties in scientific concepts which are taught in school,” Eames-Sheavly said.

“Grow With the Flow: Hydroponic Gardening in the Classroom” and “Garden in the City” are two programs Rakow has supported. “Grow with the Flow” teaches a new method of growing plants in water instead of soil. It explains how hydroponic gardening can create food in areas that, due to poor soil or lack of soil, ordinarily would not be able to sustain plants. The program will be offered to all 4-H clubs and school-age children. It could be used extensively by urban 4-hers who do not have as much soil to work with as their suburban and rural counterparts do.

“Grow With The Flow” ties into the “Garden in the City” program which began in 1987. “Garden in the City” teaches urban children how to use small plots to make a vegetable garden. “The hydroponic program has the capacity to teach urban children an approach to gardening different from the one they learned in the ‘Garden in the City’ project,” Rakow said.

Discovering programs which can be adapted to fit the needs of different 4-H clubs across the state is important to the committee. “We expect that the programs will be used differently in each county and we encourage this. Each county provides different resources for its members and it is important that the cooperative extension agents take from the programs what is applicable to their county,” said Eames-Sheavly.

Some newer 4-H programs have been designed specifically for their local region. Gruttadaurio volunteers to develop programs locally for Tompkins County Cooperative Extension and is Cornell’s 4-H natural resource program developer.

Gruttadaurio has chaired the successful 4-H Natural Resources Appreciation Program for Tompkins County since 1980. For three days, Buttermilk Falls, Robert H. Treman and Taughannock Falls state parks, along with Cornell and six other sites, host anywhere from 1,200 to 1,400 Ithaca school children for lessons provided by volunteer instructors concerning the environment. “The program has gained so much popularity. Last year we had 900 school children sign up on the first day their teachers received the registration forms,” said Gruttadaurio.

Volunteers, students and the business community have enabled the program to grow larger than other 4-H natural resource programs in the state. Fifty different lessons will be offered this year and the teachers select the three their students will participate in. Ecology Webs, Energy Sources and Conservation, Stream Exploration, The Four R’s of Recycling and Equine Extravaganza are just a few of the many offerings.

“This 4-H program is related to the school’s science curriculum,” Gruttadaurio said. “The big difference is that the lessons encourage discovery of our natural resources through actual outdoor experience.”

by A. McKiegan ’93
Tompkins County 4-Hers try to avoid getting wet as they participate in the Tompkins County Natural Resources Appreciation Program.
THE RESURGENCE OF ENVIRONMENTALISM in the world seems like Mother Nature’s dream come true. Due to the growing demand for energy and technology, the earth has increasingly become a wasteland. Chlorofluorocarbons (CFC’s) destroy the ozone layer and pollution threatens the world’s oceans, vegetation and animal inhabitants.

Realizing these dangers, countries are taking action. In 1972, 113 of the world’s nations discussed environmental issues at Stockholm and drafted the first large scale international report on development and the environment—the Founex Report. At the forefront of the discussion on environmentalism was “deep ecology” vs. “frontier economics”.

“Environmental problems must be defined historically. The relationship between man and the environment is a problematic one, but must be discussed,” explained Jorge Nogueira, Visiting Fellow in the Department of Agricultural Economics at Cornell University.

Nogueira is a professor in the Department of Economics at the University of Brazil. He has been dealing with the “ecology/economy” question since 1978, when he completed his PhD thesis on the economics of natural resources conservation at the University of London.

Nogueira explained that environmental protection involves trade-offs between economic growth and ecology. Frontier economics is economic prosperity without consideration for the ecology. Human dominance over nature, material realization, and pro-growth goals are all themes of frontier economics.

Deep ecology is diametrically opposed to the economic themes. Harmony with nature, biospecies equality, opposition to growth and small scale technology are all ecology themes. “There are many things about economy and ecology that are directly opposed,” explained Nogueira. “Industrialized countries regarded deep ecology as a bad joke by third world countries. Eco-development was impossible when trying to sustain a technologically advanced society. But something had to be done to take care of the earth. Middle ground had to be found.”

The middle ground is called “sustainable development” which tries to promote technological growth while minimizing its effects on the environment. It relies on global interdependence and economized technology; some companies are making moves toward this position now. “Sustainable development is theoretical. Implementing policies is hard,” said Nogueira.

Policies are now being tested on third world countries, and this has Nogueira, a Brazilian native, fuming. “The first world wants to practice its theories out on the third world. They are saying, ‘Do what we say. Not what we do.’”

But Republican presidential candidate David Duke claimed, “The third world countries are the main ones messing up the environment.” However, statistics compiled by researcher Pollock Shoe in 1988 show that first world countries contribute 84 percent of the CFC’s to the atmosphere, while third world countries...
contribute only 16 percent. Nogueira explains that first world countries are trying to control the resources and policies of the poorer countries. "When the English and the Swedish destroyed all their forests, they didn't ask us what to do," said Nogueira. "Now they are trying to save our Amazon forests. The Amazon puts more carbon dioxide in the air than oxygen. It's a big wasteland."

But some world leaders still feel that third world countries should take the blame and the responsibility. In the February 8, 1993 issue of The Economist, Lawrence Summers, chief economist of the World Bank said, "...From this point of view a given amount of health-impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages. I think the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable and we should face up to that."

Joao Paulo Dos Reis Velloso, planning minister of Brazil said in a 1972 interview in The New York Times, "Brazil can become the importer of pollution. ... Why not? We have a lot left to pollute. They [developed countries] don't."

Nogueira explained that environmental problems are related to poverty. While he lectures in the United States, he uses Brazil as a case study. According to statistics released in 1991 by Sant'Ana, in 1989 the poorest 20 percent of the Brazilian population received a 2.3 percentage share of the household income, while the richest 20 percent received 67.5 percent. In 1980, according to Albuquerque and Nicol's 1987 research, the smallest ten percent of the farmers owned 2.4 percent of the land, while the richest ten percent owned 45.8 percent. But the poorest produced more goods!

Would a more equal economic distribution create more balanced production from land, thereby increasing benefits to world ecology? Nogueira said yes. "If poverty, and the environment, were problems to everybody, it would be solved in 24 hours. The wealthy must push to improve ecological standards. Third world elites must understand that the poor must be empowered to gain ecological goals. When we speak of sustainable development, to whom are we speaking? We can't have it for the richest 20 percent. My priority is to design policies to benefit the poorest 20 percent."

Is there an effective middle ground between deep ecology and frontier economics? The issue is still being debated. But Nogueira is sure that third world countries should decide their own futures. Whichever position they adopt, it should benefit their poor people. "The money from the World Bank is not going to solve this world problem," said Nogueira.

Could massive eco-villages be a possible solution? "Eco-villages are closer to deep ecology," said Nogueira. "Third world countries have been living in eco-villages for four centuries." These countries are trying to reach the point where they can have the luxuries of solar energy, automobiles and industrialization.

Whatever the answer is, it is obvious that deep ecology will not feed and advance these third world countries, and frontier economics will not further the merits of a clean healthy earth. Nogueira and others are looking for the answers. Perhaps sustainable development is the answer. Imagine that—an ecology movement sponsored by Mobil. ■

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By Rey A. Hollingsworth-Falú '92

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### Distribution Of Income Within The Brazilian Population—1960 to 1989

<table>
<thead>
<tr>
<th>Year</th>
<th>Poorest Class (bottom 20%)</th>
<th>Middle Class (middle 60%)</th>
<th>Richest Class (top 20%)</th>
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</tr>
<tr>
<td>1987</td>
<td>2.7</td>
<td>34.0</td>
<td>63.3</td>
</tr>
<tr>
<td>1989</td>
<td>2.3</td>
<td>30.2</td>
<td>67.5</td>
</tr>
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Source: Sant'Ana (1991) Table 2 p.7. Reprinted with permission.
It was built in 1874 to serve as a carriage house for Cornell President Andrew Dickson White. Later it became an automobile garage. But the biggest change occurred in 1955 when it was renovated and named the Big Red Barn.

Cornell trustee Allan H. Treman '21 and other alumni funded the renovation and used the Barn as a place to socialize. Sandwiches were served for alumni prior to football games and other athletic events.

The food service expanded in 1981 when the Barn began offering lunch service to the entire Cornell community. But in December 1989, after the opening of a new dining facility named Trillium, the Big Red Barn shut down.

Today, more than two years after the Barn closed, Trillium is overcrowded. Unable to find seats, many students sit on the floor or eat their lunches elsewhere. So it may not come as a surprise that in February 1992, the Big Red Barn reopened as a Cornell Dining facility.

"You don't feel like a cow coming in to graze, you actually feel like a human coming in to have a meal," said Victoria A. Blodgett, manager of the Big Red Barn.

This time around, however, the Barn is more than just another dining hall to lessen the crowds at Trillium. The newly renovated Big Red Barn replaces The Henry as the Graduate and Professional Student Center at Cornell.

In 1990, the graduate student members of The Henry Steering Committee identified the Barn as a possible space for graduate activities. They petitioned President Frank H. T. Rhodes and Provost Malden C. Nesheim for permission and funding to renovate the facility and make it a graduate student union.

"The graduate and professional students didn't really have a place of their own on campus," Blodgett said. "They didn't have a Noyes or a Willard Straight or an RPU - those are all designed for the undergraduates."

Sharon Boedo, graduate student member of the steering committee, was formerly manager of The Henry, the closest thing to a graduate student union on campus.

The Henry was located in the lounge of Sage Hall and named after Henry W. Sage whose portrait hangs over the fireplace in the lounge. Although widely used, Boedo said The Henry was too small to meet the needs of all the graduate and professional students.

After an $830,000 renovation project, the Big Red Barn became the new Graduate and Professional Student Center.

"Our focus is really as a supportive atmosphere for graduate and professional students as they go through their academic careers at Cornell," Blodgett said, adding that the Big Red Barn is actually open to the entire Cornell community.

"As much as RPU is only for undergraduates, and as much as Noyes is only for undergraduates, the Big Red Barn is only for graduates," Blodgett said. "We don't ask for ID when you come in here and we don't ask for proof of student status."

The Big Red Barn has two main functions, Blodgett explained. From 7:30 AM until 2:00 PM, Cornell Dining serves continental breakfast and lunch. At 2:00 PM, Blodgett and the graduate student staff take over and provide snack service until closing at 11:00 PM.
her staff also arrange programs for graduate students at the Big Red Barn. Graduate student groups are invited to hold meetings, dances, parties and other social functions at the Barn.

A recent speaker from California addressed the issue of intercultural and interracial dating and marriage. Blodgett noted that this subject is of particular interest to graduate students since there are interracial couples in the graduate community.

In contrast to other dining facilities at Cornell, the newly renovated Big Red Barn offers a unique setting. As Boedo described, “It provides a rustic atmosphere. People enjoy coming here because it’s not a dining hall. It combines features of cafeteria style service with a relaxed pub-like atmosphere.”

According to Blodgett, the Barn will eventually serve beer when their liquor license is approved, but she added that alcohol is not the primary focus at the Big Red Barn.

Blodgett said a previous newspaper article was incorrect when it suggested that the Big Red Barn was a bar for graduate students. “There is no bar,” she said. “And right now the beer’s locked up in the office and no one can get it.”

If beer is made available at the Barn, Blodgett said, “It’ll be a mobile keg unit that will sit by the cash register and graduate students will be able to buy a cup of beer and that’s it. You will not get choices of beer and undergraduates will not be able to purchase alcohol.”

There are roughly 6,000 graduate and professional students at Cornell, and while the Big Red Barn provides more room than The Henry lounge, it only seats 150 people. But according to Blodgett, crowds have not been a problem at the Big Red Barn, unlike at other Cornell dining facilities, and she estimated that the Barn serves 500 lunches daily.

Boedo, who expects to have a continuing role on the steering committee which oversees the administration of the Big Red Barn, also participated in the renovation process. She said converting the second floor into an open mezzanine level added about 60 seats to the floor plan.

This additional seating makes the Barn able to better accommodate the needs of the graduate and professional students. In addition, the Barn is also available for private individuals to rent for weddings, departmental functions, meetings and luncheons.

As Blodgett explained the Big Red Barn, “Basically, it’s a place where graduate and professional students are invited to come, bring a newspaper or their work, get a cup of coffee and a bagel and sit in a nice atmosphere with colleagues and friends.”

by David W. Marston Jr. '92

Cornell President Frank H.T. Rhodes and members of the Henry steering committee gather around the Big Red Barn opening-day cake. The graduate and professional students on the committee petitioned President Rhodes for permission and funding to renovate the vacant Barn.
Art for Goodness

A PHOTOGRAPHER WHOSE Smithsonian exhibit is on a national tour. A composer whose musical compositions were recently performed by the Temple University Chorus and the Temple Symphony Orchestra. A community educator who fostered local pride among rural Puerto Ricans. What do these people have in common? Jack Delano. He fills all these roles and many more: filmmaker, designer, illustrator, musician and educational broadcaster.

Delano, Cornell University's newest Andrew Dickson White Professor-at-Large, has put his many talents to use for social change in mainland United States and Puerto Rico. "The purpose of all art is to enrich the human spirit," he said. "I don't feel I am important in my art. I don't sit around contemplating my bellybutton and trying to figure out what is going on inside me. Whatever I do, I do for other people."

Because he has done so much, in 1991, Cornell trustees named Delano to a six-year term as an Andrew Dickson White Professor-at-Large. The program, endowed in the name of Cornell's first president, brings outstanding people to the campus to meet with students and faculty during annual two-week visits. Departments face stiff competition trying to win one of these prestigious appointments. The Department of Communication in the College of Agriculture and Life Sciences nominated Delano, who was supported by other departments, institutes, museums, councils, administrative units and programs at Cornell.

Currently, Delano's Smithsonian photography exhibit "Contrasts — Forty Years of Change and Continuity in Puerto Rico" is on a three-year tour around the United States. He recently published a book of photos from that exhibition, "Puerto Rico Mio." His exhibit has been shown extensively in Puerto Rico, and some of his photos will appear at the World's Fair in Spain. He spends much of his time travelling and speaking where his work is being shown.

Delano's busy schedule was kept up during his February 1992 visit to Cornell. He signed copies of his book, met with faculty, showed some of his films, held discussions and gave lectures on photography, community education and Puerto Rican development.

An unassuming man, Delano is modest about his long list of accomplishments, both past and present. He is hardly the image of the striking, flamboyant artist. Rather he possesses quiet humor and calm dignity, the same dignity with which he endows his portraits of others. His voice is deep, slow and measured, resonant with the cultures of his varied background. Russian undertones call up images of the place he was born, and traces of Spanish rhythms enliven his English.

"I grew up in Philadelphia; my family was not well-to-do." Delano began his story. "We moved there from Russia when I was nine." In high school, he was good in music, art and science, but was not sure what he wanted to do until he received an art scholarship from the Pennsylvania Academy of the Fine Arts. The stage was set for his future, but not only in terms of his career. At the Academy, he met and fell in love with Irene, who eventually became his wife and partner in many of his artistic endeavors. Early on, he and Irene used their artistic talents for social change, painting signs and posters for protests.

Although Delano wanted to be a millionaire illustrator like Norman Rockwell, his plans changed after he received a scholarship to study art in Europe. This was the first time he had seen many famous works of art in the original. He especially admired the painters whose religious murals taught...
bibilcal history to illiterate people. "All these people were doing the kind of art I was interested in, art about ordinary people. I wanted to say something about society, but I felt I was not a good enough painter so I tried to do that kind of work through photography."

Delano began his photographic career during the Great Depression with the Federal Arts Project, documenting the lives of unemployed coal miners in Pennsylvania to increase awareness of their plight. In 1940, he got a job with the Farm Security Administration in Washington D.C., taking pictures primarily of migratory farm workers in the south.

A week before Pearl Harbor, he was assigned to the islands of St. Thomas and Puerto Rico. After the United States declared war and although the Caribbean was swarming with German U-boats, Irene sailed down to join him. They were so impressed by the pride and dignity of the people in Puerto Rico that they decided to visit again if they had the chance. "They were so warm, so friendly, generous and hospitable," said Delano. "We had never met people like that before. We had met wonderful people everywhere, but we were never invited into their homes. In Puerto Rico, we couldn't stop anywhere without being invited into the house to have some coffee and sit down and chat. Many people became close friends of ours and we are still friendly after forty years."

They did come back, this time to stay. In 1946, Delano received a Guggenheim award to do a book of photos of Puerto Rico. He was then offered a job by Governor Luis Munoz Marin of Puerto Rico, who was trying to transform the island from an agricultural society to an industrial one. Because adult education was a problem, Delano helped establish the Division of Community Education to take social action messages to the rural, almost inaccessible towns.

Because so few people were literate, the division used highly visual material to get its messages across. They dealt with health issues and building local pride. Delano headed the country's first film department and trained people to be film technicians. He produced such works as "A Drop of Water," a film about the importance of boiling drinking water to prevent disease. Irene ran the silkscreen shop that produced the advertising posters and booklets that accompanied the films.

The films were shown in the open air and became a popular community event. According to Delano, once he was showing a film near a train track and the engineer of a passing train stopped and stayed to watch the whole film. "I think the films were so effective because they were done with great respect for the people we were trying to reach," Delano said. "There was no talking down. We were teaching them but we were learning from them also."

Delano went on to manage the first Puerto Rican educational television station. The station produced many live shows, including the first children's program, broadcasts of concerts and plays, and a press interview show.

Now, when not on the lecture and teaching circuit, Delano is composing music and finishing a children's story about a black man who ran an integrated school out of his home in nineteenth century Puerto Rico.

Delano said he has accomplished so much because he is a workaholic. "Sharks have to keep moving to get enough oxygen to live. I feel I have to keep working or I will die," he explained. "It's comforting to know I will never be bored. If I get stuck writing music, I can develop film. There is always something waiting for me."

But, as he has said, he doesn't do the work for himself, he does it for others. "The greatest reward for an artist is the appreciation from others. Satisfaction is not as much from the creation, it is from observing how others react."

"The best comment I have heard about my work was not from a critic, not from a writer," Delano recounts. "I came out of a supermarket in San Juan, and ahead of me was a young woman with three children. She looked at me and said, 'You're Mr. Delano aren't you? I've seen your picture in the paper and I just wanted to tell you how much we appreciate what you've done in Puerto Rico.'"

He thanked her and asked her who she was. 'She replied, 'Oh, I'm nobody, I'm just a housewife.' That was the greatest compliment I ever had. She didn't realize when she said she was nobody, that she's exactly the kind of nobody that I do all my work for."

by Dana Nigro '93
THE PREVENTION OF PREMATURE birth in humans would eliminate sev-
enty-five percent of neonatal deaths, according to Professor Peter Nathanielsz of the Laboratory for Pregnancy and Newborn Research in Cornell University’s College of Veterinary Medicine.

These neonatal deaths may be avoid-
able in the future with the application of the lab’s recent research findings. In September 1991, after nine years of research, the lab published a study showing that a sheep fetus and not its mother determines the time of its birth. The fetus is a very clever individual... it is born at a time when it is adequately mature,” Nathanielsz said.

Although there is probably no single structure or event that actually triggers the start of labor and delivery, the focus of the laboratory research was a key element within a system that may rule these functions. This key element is the paraventricular nucleus (PVN), a tiny but complex collection of nerve cell bodies. The PVN is located bilaterally in the hypothalamus—a small but important part of the brain.

In surgeries, researchers used a radio frequency electrode to lesion the PVN’s of fetal lambs. The lambs were then allowed to remain in the womb ten days—the date of statistical significance—past the normal term of 147 days. A study of the brains’ tissue structure was then done to make sure that the PVN’s were removed successfully. Additionally, the presence of PVN-produced hormones was examined in related neural structures.

The goal of the experimentation, said Dr. Thomas McDonald, a research asso-
icate in veterinary physiology, was to see if the PVN was needed for labor and delivery to occur. The fact that the lambs were not born at normal term showed the involvement of the PVN. In the absence of this structure, “We don’t know if [the mothers] would have delivered, ever,” McDonald said.

Sheep, of all animals, have been chosen as the subjects for practical as well as theoretical reasons. Practically, said McDonald, they are docile, “a very convenient size” and carry only one or two babies at a time, compared to sows, which might carry thirteen to sixteen.

On the theoretical side, McDonald said, “There is a tremendous body of scientific literature that has been published on sheep labor and delivery.” Prior knowledge, he said, helps the lab to plan worthwhile experiments, to ask intelligent scientific questions, to avoid useless studies and to compare the re-

Primates are a few steps closer to humans on the evolutionary ladder, however, there has been no similar experimentation performed on primates to date. McDonald said, “A lot of groups are starting to work on primates,” because they offer the advantage of a reproductive system that is more similar to that of humans than of sheep.

In the face of that argument, however, Nathanielsz holds to a specific philoso-
phy about using sheep: “We often learn just as much from differences as we do from similarities.” Additionally, Nathanielsz sees no reason to believe that a system of labor and delivery such as the one they have explored would have derailed on its evolutionary voyage from sheep to humans. He calls the system that triggers birth in sheep “very clever” and “beautiful,” and cannot see that it would be drastically different in people.

As evidence to this effect, McDonald stated, “Anatomical evidence would suggest that a system similar to that of sheep exists in primates.” The anatomical guide to the sheep brain used as a referent in this theory was mapped out by Dr. Peter Gluckman of New Zealand in 1982, and was the starting point for research at Cornell nine years ago.

Research done further back in time, in the 1960s, has provided background for the Cornell lab as well. At that time, researchers determined the involvement of cortisol and the stress hormone ACTH in the initiation of labor and delivery.

“We often learn just as much from differences as we do from similarities.”
Cortisol and ACTH are produced by the adrenal and pituitary glands, other elements in the PVN system.

Such background not only assists in PVN-oriented studies, but in related projects centered on the development of the fetal brain and the timing of labor and delivery. If in fact there is no single trigger for birth, as studies in the lab suggest, then birth is a natural consequence of the fetus attaining a certain critical level of development of the systems it needs to survive. For example, the lamb's muscular system must be sufficiently developed for it to be able to get up, walk on its own and nurse. Its mother will not help it.

McDonald is also currently studying the effects of the neurotransmitter, vaso-active intestinal polypeptide (VIP), on circadian rhythms, or "the biological clock." McDonald said, "Fetuses spend a lot of time breathing in temporal patterns." At a later point in the study, he will attach small electrodes to the diaphragm of a fetal lamb. Because of the lamb's varying breathing rates, different readings will appear on the attached oscilloscope or physiograph. McDonald will then use these readings in a search for normalcy in fetal breathing patterns.

Respiration is an extremely important aspect of fetal development, because of the implications for prenatal muscular development.

VIP will also be used as a subject for development studies. "We are looking at when and where hormones first appear in the brain," said McDonald. "The pattern of appearance changes over time."

Another project involves the direct study of labor. "We have done many recordings of uterine muscle contractions, to see the patterns of activity for normal and abnormal labor," Nathanielsz said.

Studies such as these conducted in the vet college may clear the path to understanding human birth. Nathanielsz said, "If you could find out what signals birth, new solutions to problems could be offered. The idea is, that [this system] is going to be proved the same in humans as in sheep, with different wrinkles."

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by Gretchen Leigh Metzger '92

Dr. Thomas McDonald and Dr. Peter Nathanielsz examine a slide projection of a human brain. They are conducting experiments at Cornell to determine which mechanism in the fetal brain of sheep triggers birth. The doctors hope these experiments with sheep will also explain human reproduction.
Robert Jamison wants to start his own manufacturing business. He wants to determine the best location for his business and thus needs certain information. He needs to find out about the transportation networks of this particular area, the level of training of the labor force for that region and the appropriate land use and land cover information, among other things. The Cornell Laboratory for Environmental Applications of Remote Sensing (CLEARs) has most of the answers Mr. Jamison needs.

CLEARs is one of six units within the Center for the Environment (CfE), an organization that focuses on the physical and biological environment of humans and on humans’ interactions with the environment. Established in 1984, CLEARs is a result of a merger between the Resource Information Laboratory in the College of Agriculture and Life Sciences and the Remote Sensing Program in the College of Engineering.

CLEARs seeks to improve inventory, analysis and management of environmental resources for increased environmental quality and economic development, especially in New York state. The CfE unit is the focal point for Cornell University activities in remote sensing, resource inventory and Geographic Information Systems (GIS).

CLEARs is primarily supported by external contracts and grants. The agriculture and the engineering college support staff positions and provide the space in which the CLEARs staff, equipment and library are found.

William D. Philpot, associate professor in the School of Civil and Environmental Engineering, is presently the program leader in the remote sensing division of CLEARs. Remote sensing is the detection, measurement and evaluation of significant features on the earth’s surface without touching or being on the ground; it is information gathering from a distance. Using the remote sensing process scientists can acquire data through imaging or nonimaging sensors, such as cameras, radars and lasers, operated from spacecraft, aircraft, or the laboratory.

Remote sensing can improve the accuracy of land use, crop, forest and soil resource inventories. It is used to monitor urban, agricultural and engineering development. “Resource inventory uses remote sensing to collect information and then puts this information in a form that others can understand,” said Eugenia M. Barnaba '77, program leader in the resource inventory division and senior extension associate. Barnaba explained that this resource data can then go into GIS.

Stephen D. DeGloria, program leader in GIS and assistant professor in the Department of Soil, Crop and Atmospheric Sciences in the ag college explained, “GIS is the process of visualizing, analyzing and managing environmental data related to climate, soil, vegetation, water, agricultural and other natural resources.”

Resource inventory data is converted into a hard copy (paper) map from the interpretation of remotely sensed data.
"This data can be encoded in the computer, digitizing various points, lines and polygons, to create a computer-compatible map," explained DeGloria. The whole process gives an end product that can be used to visualize environmental resources and to develop different planning scenarios on ways the land can be used.

The data bases produced by CLEARS can be used to find out what lands are suitable for growing certain kinds of crops. DeGloria commented, "Farmers need to know the range of possible types of cropping systems suitable for their land that won't degrade soil or water resources." Farmers could use non-degrading environmental practices by using GIS maps to locate land suitable for diversified cropping systems.

Located in Hollister Hall, the CLEARS library houses aircraft and spacecraft images mainly of New York state and the northeastern United States. The aircraft images span some 40 to 50 years of environmental change. The majority of spacecraft images are acquired by sensors on Landsat satellites, and photos from the earth-orbiting satellites Skylab and Seasat are also available. These images are used for historic studies such as time profiles to detect landfills, assess land use changes or monitor stream channel development.

CLEARS is presently working in collaboration with the Putnam County, New York, Department of Planning on the development of a land use and land cover inventory. The two groups are trying to determine what the land use or land cover is for every single acre of land in the county; if land is used for farming, a boundary will be drawn around that area and labeled agriculture to distinguish it from the adjacent land use. CLEARS already had similar data for Putnam County that was done in 1968 and proposed to do a 1991 inventory with which to make statistical comparisons. Observing the patterns and trends of change over the 23-year period will help the planning department with its decision-making for managing county resources.

The staff of CLEARS interacts with Cornell faculty, staff and students through cooperative research, support services and various forms of instruction and communication. "I work primarily on outreach activities, but also consult with students on their class projects, theses and development of basic concepts," said Barnaba. Members of the staff offer or support courses through Cornell's academic departments. CLEARS also offers some financial support to students through research assistantships or hourly work.

CLEARS provides assistance not only to the Cornell community but to outside users as well. "CLEARS is used by cooperative extension agents, state and federal agencies, local governments and private consultants who are doing environmental assessments," said Barnaba. "Anybody who has a need for any of the areas of expertise that we have can come to CLEARS."

by Cozzette Lyons '92

An aerial photograph of Central New York before a computerized representation was produced by CLEARS. The photograph was taken by astronauts on NASA's Skylab in 1973 from a distance of 250 miles.
FOOD LOVERS, REJOICE: BLUEBERRY muffins, chocolate pudding, pizza and ice cream may not have been typical diet fare before — but now they are. All appear on the menu of a new low-fat diet formulated by researchers from Cornell University's Division of Nutritional Sciences.

On average, subjects on the low-fat diet lost five pounds in 11 weeks without having to count calories. According to researcher David Levitsky, a professor of nutritional sciences, the low-fat plan works primarily because it makes dieters limit their intake of fat, rather than calories.

"Currently, the only techniques advocated by either medical people or nutritionists are low-calorie diets," Levitsky said. "They reduce the volume of food, the calories. The way I read the literature, these diets simply don't work."

Levitsky explained that low-calorie diets do not work because the body has a mechanism that adjusts to calorie depletion by increasing hunger; thus the hapless dieter may respond to a low-calorie diet by eating more, and not losing any weight.

The researchers explored alternatives to low-calorie diets by first examining whether a reduction of dietary fat would have the same effect. "We're looking at how well the body compensates calorically for the reduction of fat," Levitsky said. "It turns out that the body is smarter than you are, you should get hungry and increase the volume of food that you eat, and your intake should go back to what it was previously. If that's the case, then low-fat diets shouldn't work."

Luckily for dieters everywhere, the low-fat plan did work. While on the diet, subjects experienced only a slow rise in food intake: they ate about ten percent more food than usual.

"That was not sufficient to compensate for the reduction of calories on the low-fat diet," Levitsky explained. "Consequently, these people lost weight throughout the duration of the study."

In the study, published in the May 1991 issue of the American Journal of Clinical Nutrition, 13 women dieted for a total of 22 weeks. Researchers randomly assigned the women to one of two diets: either a control diet, which contained about 35 to 40 percent of calories as fat, or the low-fat diet, in which only 20 to 25 percent of the calories came from fat. Overall, the low-fat subjects lost twice the amount of weight as the control group.

Both groups were given breakfast and dinner at Cornell's Human Nutrition Research Unit. For these meals, all subjects received exactly the same foods, only the low-fat dieters' foods contained less fat than those of the control group. Subjects were allowed to eat as much food as they liked.

In addition, subjects chose their own lunches and snacks; the wrappers and leftovers from these meals were brought to the researchers so they could record the women's total food intake.

Surprisingly, the dieters enjoyed the low-fat foods. According to Levitsky, the

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**Low-Fat Menu**

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Lunch</th>
<th>Dinner</th>
</tr>
</thead>
</table>
| Monday    | Granola Blueberry muffin | Turkey sandwich | Chili w/ corn muffins
|           | Banana muffin Milk | Blueberry yogurt | Carrot-raisin salad
| Tuesday   | Strawberry yogurt Blueberry muffin | Tuna sandwich | Chicken stir fry
|           | | Oatmeal cookies | Waldorf salad
| Wednesday | Pineapple yogurt Bagel | Cheese sandwich | Macaroni w/ tomato sauce
|           | | Vanilla yogurt | Glazed carrots
| Thursday  | Blueberry yogurt Apple muffin | Turkey sandwich | Lentil stew
|           | | Oatmeal cookies | Broccoli and biscuits
| Friday    | Granola Blueberry muffin | Tabouli salad | Vanilla ice cream
|           | | Pineapple yogurt | Pizza
| Saturday  | Strawberry yogurt Bagel | Chicken salad | Cole slow
|           | | Banana muffin | Oatmeal cookies
| Sunday    | Vanilla yogurt Apple muffin | Peanut butter & jelly | Pasta primavera
|           | | Oatmeal cookies | Cucumber salad
|           | | | Cookies & cream ice cream

The information in the graph was supplied by David Levitsky.
low-fat diet received a slightly higher “palatability” rating than the control diet. “One of the things we were concerned about was, what if they didn’t like the low-fat foods? They would reduce their intake, but because they didn’t like the food,” The palatability rating, however, suggested otherwise. Almost anyone can go on the diet for any length of time without fear of health risks, Levitsky added. Although it has not been tested on men yet, the diet should prove as effective for them as for women.

Age is also not a factor. Adults of almost all ages can follow a low-fat regimen without risk. Levitsky did caution, however, that the diet could pose health problems for children.

Another benefit of the low-fat diet is that unlike certain fad diets, the low-fat plan does not cause a deprivation of any other nutrients. While on the low-fat diet, Levitsky said, subjects’ protein, carbohydrate and micronutrient levels never changed.

What about the body’s need for fat itself? According to Levitsky, government guidelines recommend that 30 percent of calories in the diet come from fat. However, no studies suggest that dropping below the 30 percent level is actually harmful. “They don’t say there’s a hazard. As far as I know there is none,” Levitsky said.

“The one problem may be with fatsoluble vitamins,” he added. “There may be a decrease in the absorption of fatsoluble vitamins as you decrease the amount of fat.” However, he mentioned that as the low-fat diet emphasizes consumption of vegetables high in fat-soluble vitamins (A, E and D), dieters’ levels of those vitamins may actually increase.

Another health concern involves the very thin. Can people risk losing too much weight on a low-fat diet? Levitsky doesn’t think so. “Eating is like a mechanism to prevent you from getting too thin. Our evidence so far suggests that thin people respond by getting hungrier.”

A final, crucial health benefit of the low-fat diet stems from the fact that it does not merely promote weight loss; it also helps prevent heart disease, cancer, stroke and arteriosclerosis, Levitsky added.

Having examined the low-fat diet’s taste, universality and healthfulness, one question remains: can it work in the real world? Levitsky thinks the answer is yes, and a second experiment, which he calls the “community study,” supports his conclusion.

In the community study, the researchers merely told subjects to reduce their fat intake; the subjects were still able to choose their own foods and prepare them any way they liked. Thus the community study approximated reality more closely than the first experiment, in which some meals were prepared for the subjects.

One result of the study was that subjects lowered their fat intake until only about 25 percent of their calories came from fat, even less than the government guideline of 30 percent.

Said Levitsky of the government regulation: “The argument that the government uses for not making it lower is that that’s as low as the American population can go.” Clearly, with the subjects of the community study, this was not the case.

Secondly, the community study subjects were as successful at weight loss as their laboratory counterparts. “They lost the exact amount of weight as we found in the laboratory, which is further evidence that simply lowering your fat intake is sufficient to cause a reduction in body weight,” Levitsky said.

A final finding, however, suggested a potential drawback of the low-fat diet. Levitsky said that although subjects in the community study liked the diet, they could not continue it for long periods of time because they couldn’t get their family members to go along with it.

“If you want to affect the fat content of a family, you have to understand something about the dynamics in a family unit to get everyone to change. That’s what we’re working on now,” Levitsky said.

Anyone interested in a low-fat diet can start one fairly easily, he added, just by buying low-fat versions of everyday foods. “Unfortunately, right now you have to calculate the percent of calories in food as fat,” Levitsky said. “I recommend that you eat as much as you can of foods that contain less than 20 percent of calories as fat, and as little as you can of foods that contain over 20 percent of calories as fat.” Levitsky also suggested that intake of desserts high in fat and red meat be minimized.

Although conclusive results about the low-fat diet have not yet been reached, it just may prove to be the answer to a dieter’s dream.
TO SOME, MAYFLIES AND STONEFLIES may not seem like the most glamorous creatures to study. And swishing about in a creek on a crisp January afternoon may not seem like a great activity. Yet students in Freshwater Invertebrate Biology find that spending an afternoon in chestwaders, surrounded by bugs, is an exciting way to study insects and their important role in the environment.

Freshwater Invertebrate Biology, a course in the Department of Entomology, has proven very popular with insect-loving students. Professor Barbara L. Peckarsky succeeds in sharing with students her enthusiasm for the ecosystem's often forgotten members.

In class, Peckarsky discusses the biology of aquatic insects and their role in the ecosystem. Rather than give a dry recitation of each insect species' vital statistics, she covers topics such as evolution, body structure, life histories and behavior, using different species as examples. She also shows students how useful the insects can be for testing water quality. As a result, students gain valuable skills for careers in environmental fields.

Peckarsky addresses intriguing questions concerning the insects' adaptation to their aquatic environment: How do they breathe in or out of water? How do they defend themselves? And how do they find mates?

For example, aquatic insects have complex life histories, meaning they spend part of their life in water, and part of it on land. Thus the species had to evolve distinct solutions to adapt to the different challenges presented by each habitat. These solutions can be quite extraordinary. For instance, water scorpions spend most of their lives in water, but still disperse on land. Instead of organs for breathing only in water, these insects actually have a sort of snorkel projecting from their body which allows them to breathe air while they are in the water.

The class also examines the conservation of aquatic insects and the factors which lead to their inability to reproduce and maintain their population. The challenges insects must face are overlooked by many people. Peckarsky noted, "[The insects] don't get much ink in that area because the fish are much sexier. Everyone cares about the fish: no one cares about the mayflies. Many people just think bugs are a nuisance."

Bugs are not just a nuisance, however. Aquatic insects play a vital role in the environment, and their destruction could have disastrous effects on their ecosystems, Peckarsky said.

Aquatic insects are well known as fish food. But, they are not at the very bottom of the food chain. Rather, they are firmly intertwined in the whole ecosystem. Many species feed on algae, insects and dead and decaying organic matter which has been colonized by proteinaceous fungi and bacteria.

The decomposers play an important role in processing leafy materials that collect in the water and threaten to choke waterways. Although the degree
of their importance depends on other conditions such as temperature and water flow, insects do help speed decay by digesting the leaves.

Aquatic insects serve a number of other functions in the ecosystem. Peckarsky pointed out that in mucky situations such as lake floors, insect larvae kick up nutrients that would otherwise settle and be lost to free-swimming organisms. She described the larvae as the "earthworms of aquatic habitats."

Researchers are now finding that certain aquatic insects are also excellent water quality indicators. Traditionally, people have tested water quality using expensive chemical tests to search for toxins and fertilizer residues. The problem they faced, Peckarsky explained, is that many "...toxins are transient. They get diluted so when you test for them, they don't show up. But their residual effects remain."

She explained that bugs will show signs of pollution effects for about one year, their approximate life span. Thus the insects can indicate a problem that otherwise would go unnoticed.

Although using insects as indicators requires an intimate knowledge of the families, genera and sometimes species, and the evidence they show is indirect, people still find them very practical. Their small size and year-long life span make the insects useful as biological indicators.

Because aquatic insects have such practical uses, an understanding of their biology and ecology is a handy skill students can bring to their future careers. Students seem pleased to gain valuable expertise in this field. Peckarsky noted that the information her students learn makes them more hireable in government agencies and environmental firms. Susan L. Wood '92, a natural resources major with a concentration in aquatic sciences, added, "Entomology allows for a certain amount of specialization."

Peckarsky has been involved in a number of projects which used aquatic insects to test water quality. One local project concerns Cornell University's building expansion into the Orchards. Peckarsky is acting as a consultant for an environmental impact assessment of Cascadilla Creek. She, along with Ichthyological Associates, Inc., an environmental consulting firm, will test the area and make quality assessments of the stream's natural resources to serve as a basis for comparison as the project progresses.

In another project, Peckarsky, Ichthyological Associates and Cornell undergraduates are using biological indicators to help with the University's efforts to clean up an old chemical disposal site near Tompkins County Airport. The Department of Maintenance and Service Operations is building a treatment plant on the site where they will contain potential toxins and treat groundwater to make it drinkable.

"I'm impressed by their hard work and sincerity," Peckarsky said of the University. "They've been very responsible and serious in their efforts."

Although Peckarsky and her students use biological indices to test for chemical effects on creeks and streams, they can also test for physical stresses. She noted that physical disturbances, such as channels, dams and water diversions, are often much more harmful than chemical disturbances which can be diluted. Cutting down trees, altering erosion patterns and changing light intensities all drastically affect the conditions of the water, killing some species. Altered water temperatures may not allow many insects to complete their life cycles, and increased erosion makes the stream floors mucky decreasing the water quality.

Peckarsky is dealing with physical stresses in Colorado where large cities divert water from the mountain streams. She and her colleagues are attempting to convince people to leave the natural flow in the streams because once the damage is done, Peckarsky noted, "The outlook for recovery is real bleak." She added that once a stream has been irreversibly affected, "You reduce water quality or quantity, get fewer organisms—forget trout. We are seriously jeopardizing the habitats."

The lessons learned in Freshwater Invertebrate Biology are important ones, which lie near the base of our ecosystem. And Professor Peckarsky's innovative style is turning students on to the lives of aquatic insects, showing them, as Wood pointed out, that "A bug is not just a bug."

by Melissa Glim '93
IN 1968, MARIJUANA AND A RISING OPPOSITION to the Vietnam War were in vogue. The United States was about to put a man on the moon and the assassination of Dr. Martin Luther King Jr. sparked racial riots around the nation. Richard M. Nixon was elected president. Against this backdrop of change, New York state wrote a high school biology syllabus. Almost a quarter of a century later, the world has continued to change, but the syllabus has undergone only slight modification. Much of it—some say too much of it—is still in use at high schools around the state.

But the Cornell Institute for Biology Teachers and the New York State Education Department recently applied for a joint National Science Foundation grant to completely revamp the state’s high school Regents Biology syllabus, on which annual Regents exams are based.

CIBT, an outreach program developed by Cornell University’s Division of Biological Sciences, is designed to help high school teachers catch up with recent advances in biology through lectures, workshops, field trips and innovative take-home lab exercises designed for direct transport to the average high school classroom. The attempt at syllabus revision is an outgrowth of CIBT’s summer program for biology teacher enhancement.

The state syllabus was last overhauled in 1968 and has since undergone only slight adjustments, said Bruce R. Tulloch ’68, an associate in science education at the New York State Education Department. Minor adjustments in 1982 and 1983 updated a few topics, but “Essentially, we haven’t had any dramatic changes in the overall syllabus in 24 years,” Tulloch said.

Since there is no money available for syllabus reorganization, the State Education Department has been unable to move beyond preliminary review of the syllabus, he added. Without the sorely needed revision, New York state high school biology teachers remain shackled by a syllabus that some claim emphasizes memorizing hundreds of definitions, rather than applying broad concepts.

Cornell first approached the state about revising the syllabus in the summer of 1990. The Division of Biological Sciences reviewed the state syllabus in preparation for CIBT’s summer teaching program, which invites high school biology teachers to the Cornell campus for three weeks of teacher enhancement. When looking over the syllabus, CIBT coordinators were amazed to find that much of the material was outdated and some of it was completely wrong.

“We first saw the syllabus back then and we were shocked,” said Peter J. Bruns, director of the Division of Biological Sciences. “It was poorly organized, the emphasis was terrible. It was basically a vocabulary exam and there were real errors.”

The proposed revision would reduce the number of facts and terms students are required to memorize and increase the emphasis placed on major biological concepts and ideas, Tulloch said. In addition, the new syllabus would take a more unified approach to biology. Instead of a “laundry list” of mandatory, compartmentalized topics, the syllabus would show stronger links between biology’s major underlying threads and themes, Tulloch said. Rather than encouraging mere memorization, the new syllabus would invite students to consider the human condition and its relationship to technology and the environment.

Last summer, CIBT organized a three-day conference to study the syllabus and its shortcomings. The conference, held at Wells College in Aurora, New York, was attended by more than 75 people, including high school teachers, state officials and professors from Union, Barnard, Manhattan and Hamilton colleges.

Bruns called the attempt at syllabus revision a “daunting undertaking.”

“When I think of the size, scale and politics, I back away from it. When I think of what should be done with it, I want to go through with it,” he said.

CIBT and the state originally applied to the National Institute of Health (NIH) for funding and although NIH supported the proposal, it deemed the project inappropriate for NIH funding. NIH then directly submitted the proposal to the NSF and Cornell is awaiting a response. If approved, the almost $1 million grant would be used over approximately three years. During the first year, a team of writers would draft a new syllabus. The revised edition would then undergo two years of pilot testing.

Any attempt to revise the syllabus will undoubtedly be a cooperative effort between Cornell, the state education department and New York state teachers.

“Sometimes University scientists get in and don’t understand the context. We need to work together,” Bruns said.

Some teachers agreed that the syllabus needs a major overhauling. Nancy V. Ridenour ’65, the former president of the National Association of Biology Teachers and an Ithaca High School biology teacher, is among those working with Cornell on the syllabus review. “I think it’s sorely in need of a revision,” Ridenour said, adding that the last Regents exam was “a series of trivial pursuit questions and did not reflect conceptual learning.

“The Regents exam is fraught with details that are nonsensical to the students’ lives and do not support critical learning during the year,” she said. If Cornell’s joint grant proposal is approved, New York state’s high school biology system may finally catch up with the times.

by Jill Rackmill ’93
EARLY SATURDAY MORNING OF Commencement weekend, a team begins to assemble red and white geraniums around a large tent for the Board of Trustees and President Frank H.T. Rhodes's breakfast reception on the arts quad. At the entrance of the tent, they assemble a flowing stream of red and white geraniums, palm leaves and dracaena spikes to provide a fountain effect. Among the team members are professors, technicians, research specialists, students, and their spouses, children and friends. They work together to add color and excitement to every graduation weekend at Cornell.

As the new and returning Cornell students arrive on campus in late August every year, members of the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences are preparing for the University's May Commencement ceremony. They take part in growing and preparing the floral arrangements that appear at the Board of Trustees and President Frank H.T. Rhodes's reception, Convocation, ROTC Commissioning, Baccalaureate, Commencement, and other activities during the weekend of graduation. John Kumpf, a research support specialist with the floriculture department is involved in all aspects of the floral decorations. "The whole department puts in an effort, including many people who have graduated—they come back to help us at Commencement," said Kumpf.

The floriculture department has been providing floral arrangements for over 44 Commencement weekends at Cornell. According to emeritus professor Raymond T. Fox '47, MS '52, PhD '56, in the late 1940s, when the Commencement ceremony was held in Barton Hall, the department decorated the large indoor stage with cut branches of rhododendron imported from Pennsylvania. The six to eight-foot tall branches were arranged in pails as part of the backdrop of the stage. Large white peonies and chrysanthemums were placed on the platform in front of a red curtain that ran behind the stage. "We always tried to bring in the red and white theme," Fox said. In front of the stage, Fox and his team arranged window boxes full of coleus plants whose leaves are a dark red foliage that was deemed "Cornell red" and therefore representative of the University.

The Cornell red color continues to be represented at the Commencement ceremony by descendants of the same coleus plants used in the 1940s. Since 1997, cuttings from the coleus plants have been grown in the University greenhouses every winter in preparation for the May ceremony. "About 400 plants are grown every year to provide decorations for both the Commencement ceremony on Schoellkopf Field and Convocation in Bailey Hall," Fox said. The red and white geraniums that grace the Board of Trustees and President Frank H.T. Rhodes's breakfast reception, Convocation and Commencement are also grown in the greenhouses. Every year an alumnus of the ag college, Robert J. Oglevee '50, donates over 300 geranium cuttings to the University for Commencement weekend.

Barbara Stewart, a technician with the floriculture department, supervises the care of the geraniums when they arrive in the fall, ensuring that they will reach the perfect size in time for Commencement. "We grow the type of geranium variety commonly seen in family gardens by the driveway or in large patio containers, so we are forcing them to grow in different ways," Stewart said.

The involvement of the department of floriculture at Commencement is a cooperative effort. "Graduate students, staff and their kids—a lot of people come together at graduation to make it work," Stewart said. "This is sort of a family operation," added Kumpf. Both Stewart and Kumpf credit Professor Fox for the enthusiasm generated by the department in decorating Cornell's Commencement. "Dr. Fox's involvement is essential to our effort—even though he is retired, he acts as a consultant and is actively involved every year," Kumpf said.

Cornell University's Commencement Coordinator Connie Mabry has worked closely with the floriculture department for three years. "Dr. Fox, John Kumpf and Barbara Stewart are the caring people behind the beautiful floral arrangements. They make sure that all the details are perfect for every event during Commencement weekend," Mabry said.

On Sunday morning, the same team assembles the red and white floral decorations on an outdoor platform on Schoellkopf Field. Rows and rows of flowers in bloom—red and white geraniums, white caladiums, and red coleus—descend in perfect order, flanking a large red and white centerpiece in the middle of the stage. Floral preparations for another Cornell Commencement are ready once again to grace the graduation ceremony.

by Mary-Jo G. Stewart '92
Jay Hyman Professor

George V. Kollias, professor of wildlife and zoological medicine at the University of Florida, has been appointed to Cornell as the first Jay Hyman Professor of Wildlife Medicine in the College of Veterinary Medicine.

Kollias, whose research focuses on the pathogenesis of neonatal infections in birds, will develop and lead a comprehensive, multidisciplinary program in wildlife medicine. He is a DVM graduate of the University of Missouri.

Cornell Agricultural Engineers

Cornell agricultural engineers have developed the first known bioreactor system that can completely break down toxic chlorinated solvents into common salt, water and carbon dioxide, thereby purifying highly contaminated water into drinking water.

William Jewell, the professor of agricultural and biological engineering who designed the bioreactor said that the new technology could be used to treat thousands of sites around the country that are polluted by millions of tons of industrial chemicals.

Robert F. Becker

Robert F. Becker, associate professor in the Department of Floriculture and Ornamental Horticulture and an extension specialist at Cornell’s New York State Agricultural Experiment Station in Geneva, received two awards at the 1992 New York State Vegetable and Direct Marketing Conference held January 27-29, 1992 in Rochester, New York.

According to Carol MacNeil, cooperative extension agent and this year’s planning committee chairperson, Becker had been responsible for chairing these statewide vegetable conferences from 1987 until last year.

Becker has been with Cornell since 1959 and conducts extension programs, variety evaluation, fertility, and tillage research. The history of vegetable production and heirloom vegetable varieties is of special interest to Becker, who has taught classes on this subject to horticulture students at Cornell.

Becker received his BS degree in horticulture and his MS degree in plant pathology from the University of New Hampshire.

Understanding Science

A new journal called Public Understanding of Science was founded in January 1992 by John Durant, assistant director at the Science Museum Library of the United Kingdom.

The aim of the journal is to "present new work on the public dimensions of science and technology in a way that is accessible to all who may be interested in it—natural scientists and social scientists, policy makers, industrials, media analysts and museum leaders, educationalists and historians," said Durant.

Bruce Lewenstein, an assistant professor of communication at Cornell and United States editor of the journal said, "This journal crystallizes a field—really bits of fields—that have been developing for 15 years or so."

Levin Elected to Academy

Simon A. Levin, professor of biological sciences and ecological systems, is one of seven faculty members newly elected to the American Academy of Arts and Sciences. Fifty Cornell faculty members are currently members of the Academy. It was founded 212 years ago by John Adams and other intellectual leaders prominent in laying the philosophy for the United States.

Study of Toxic Cleanup

The health effects of toxic substances and methods to clean up waste sites using biological methods will be the substance of a study to be funded by a $2.4 million grant from the National Institute of Environmental Health Sciences. The program will be administered by the Cornell Institute for Comparative and Environmental Toxicology and the Cornell Biotechnology Program. James W. Gillett said the grant will fund basic research initiatives into biomedical problems that relate to toxic substances such as PCBs, heavy metals, and bioremediation techniques to remove toxics from the environment.
JIMMY HOFFA'S SHOE FOUND IN ALFALFA ROOM!

CORNELL COUNTRYMAN

A MAGAZINE OF AND ABOUT THE PEOPLE OF THE NEW YORK STATE COLLEGE OF AGRICULTURE AND LIFE SCIENCES

EZRA CORNELL'S GHOST PLANTS POISON IVY!

PLANT BREEDING DEVELOPS WOODEN BREAST IMPLANTS

"NO SPLINTERS!"

AG. GRADUATE SWALLOWED BY WHALE . . .

“I ATE FISH ALL DAY!”

AND LIVES!
About the Issue

Behind the thin veneer of prelims and lectures, the College of Agriculture and Life Sciences is home to a wealth of intriguing histories, studies and laboratories. This issue of the Cornell Countryman explores the lesser known facets of ag college life. Historical articles showcase the role of lice in history and Forest Park, the roots of the University. Other articles highlight such interesting nooks as the veterinary college's poisonous plants garden, and the beekeeping labs. A number of articles in this issue examine some fascinating research at the College, ranging from finding organic ways to decompose waste products to the secrets of migratory bird navigation to Dr. Antonie Blacker's studies of frogs. Our feature article shows off the new trees which were planted on the ag quad to honor our alumni in the spring of 1992.

On the cover:

Jimmy Hoffa's shoe found in the Alfalfa Room? A graduate student swallowed by a whale? What could these headlines possibly mean?

Designed by Rey A. Hollingsworth-Falú, our October cover carries out our theme of quirks on the quad. Perhaps nothing quite as outlandish as an Ezra's ghost sighting has actually taken place at Cornell, but we are sure that some of the out-of-the-way sights and studies are just as unusual, and just as interesting.

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EVERYONE HAS BEEN FAMILIAR AT one time or another with lice, the pesty insects which may infiltrate the tops of our heads and live in our hair with the hope of producing offspring. Throughout thousands of years of human involvement with this creature, many historical events have occurred. Several of these events owe their outcomes not only to the people involved in them, but also to the lice inhabiting their bodies.

Edgar M. Raffensperger, professor emeritus in the Department of Entomology and former instructor of a course called “Cultural Entomology,” discussed the louse itself and its role in human history.

In discussing the louse itself, Raffensperger said that lice are wingless, obligate parasites, with flat bodies and hook-like feet which allow them to cling to human hairs. Once attached, lice feed on blood, using their piercing and sucking mouthparts. They have a relatively short life cycle of about one month.

Raffensperger said people may become infested by two kinds of lice that are host-specific to humans and the human body temperature: Pediculus humanus capitis (head lice), and Pediculus humanus humanus (body lice). Lice rarely leave the warmth of their hosts and thus spread only through close physical contact between hosts. Most importantly, these insects transmit a deadly microorganism-caused disease called typhus. For this reason, among others, lice have played an important role in the history of humans.

Lice have also added to the English language. Raffensperger states that “louse” is singular for lice, but has become a slang word for scoundrel. “Lousy” originally referred to someone who was infested with lice, but has come to mean dirty or disgusting. The term “nit-picker” also originated from lice, he said, now meaning “one who picks out tiny details.” Eggs of lice are called nits.

Raffensperger explained, “Many of the following stories about lice are not based on scientific fact, but rely more on folklore and interpretation.” Beginning with a story about human evolution, he said anthropologists have discovered that many modern primates practice grooming, which is essentially picking the lice out of the hair of others. This act, along with the use of tools, requires an opposable thumb. Grooming is believed to be one of the factors leading to the evolution of the opposable thumb and hence the human species.

Sometime later, in AD 1170, Thomas à Becket, the Archbishop of Canterbury—a very controversial and political figure—was put to death. In those days, said Raffensperger, the cathedrals were not heated and there was a need to wear many layers of clothing during the cold months. Becket’s clothing created a perfect environment for the lice on his body to multiply and feed on his person. As his corpse cooled, people noticed lice abandoning it. The crowd of men surrounding his body got into an argument about whether the Archbishop was a saint for bearing the insects or a fool. According to Raffensperger, the debate ended in a big fistfight in the cathedral.

Lice have greatly influenced human wars, in the guise of typhus. “Typhus is considered to be a disease of war,” said Raffensperger, “in which many people are packed tightly together, allowing lice infestation to develop quickly.” According to Raffensperger, the Battle of Bosworth in 1485 pitted two armies against one another in an attempt to take control of the English throne. On both sides, however, troops became very sick with typhus. Eventually there was a victor, but years passed before the winner could finally take control. Raffensperger pointed out that similar typhus-related incidents occurred at the Sack of Rome in 1527 and in the Thirty Years War from 1618 to 1648.

The 1812 invasion of Russia by Napoleon and the French was a failure that dashed Napoleon’s dreams of taking over the world. According to Raffensperger, typhus-related casualties in the French army outnumbered the deaths from wounds and starvation.

According to a member of the Russian army, the typhus situation was so bad that soldiers at the Battle of Moscow burned the clothing of lice-infested troops. Due to their liquid content, Raffensperger said, when lice heat up, they explode and make a popping sound. Raffensperger said that he interprets the cannon firing in Tchaikovsky’s 1812 Overture—one of the first musical pieces to include the sound of the cannon—not as gunfire, but as the sound of the lice burning and exploding in the fires of Moscow.

When Napoleon’s army fought and lost at Waterloo, over 40 percent of his surviving troops were sick from typhus. Historians have speculated, Raffensperger said, that if his army had been in better health, England might have lost the battle, Napoleon might have conquered the world, and we might all be speaking French today.

The Crimean War in 1854 also saw many cases of typhus in both the British and French armies. British soldiers with typhus were treated in unsanitary hospitals where the disease spread even further. When Florence Nightingale began to implement sanitation measures in war hospitals, Raffensperger said, she inadvertently stopped the typhus.

Throughout the twentieth century, scientists have come to learn about lice and the microorganism they carry which causes typhus. Raffensperger pointed out that “Today typhus is still around, but now we have a better way of controlling the insects and thus the disease.”

To all his stories of the role of lice in history, Raffensperger added an interesting point that “Blacks are seldom infested with head lice because of the coarse character of their hair. The occurrence of louse-borne diseases such as typhus in black history are quite rare.”

by Jadam Kahn ’92
RHODODENDRON FLOWERS SWAY gently in the breeze; the moonseed's purple fruits beckon; colorful hyacinths delight the eye. Though their names are familiar and their appearances entice, don't be fooled: these plants are dangerous.

Each has a place in the W.C. Muenscher Poisonous Plants Garden, in the New York State College of Veterinary Medicine. The 50-by-100 foot garden, which contains more than 100 species of poisonous plants, offers veterinary students a chance to identify the fearsome flora and learn their effects on animals.

According to a brochure about the garden published by the Cornell Plantations, professor Walter C. Muenscher started the garden in the late 1940s by transplanting toxic specimens from the wild. Muenscher hoped to educate students so that poisonings could be prevented.

Today, the garden serves much the same purpose. "Plant poisoning is an important part of the curriculum," said Larry Thompson, a clinical toxicologist with the veterinary school's diagnostic laboratory who assists Dr. Mary Smith in teaching "Poisonous Plants."

"It's a very difficult thing to teach, because slides or pictures only represent one point in a plant's life and students should be familiar with each growing stage."

"That's one of the reasons the garden was started here: they can go out and look through the plants that are important and see them at different stages of growth."

The poisonous plants garden is diversified by specimens of poisonous plants from across the nation. "We try to prepare the students not only for veterinary practice in New York or in the New England area but also elsewhere," Thompson said.

Generally, the garden's contents remain the same from year to year, Thompson said—though species are added when new issues in poisonous plant ingestion arise. "As different problems come up, new plants will be introduced," he said.

He added that the introduction of new plants is not easy: each plant has its own particular needs, among them a certain kind of soil. These conditions must be approximated when a new plant is added.

Workers from the Cornell Plantations are responsible for the care of the garden, Thompson said. He praised their maintenance: "The garden is very well-kept in my opinion."

All veterinary students root through the garden at some point during their education, if only to study for exams. "In order to be a licensed veterinarian, you have to pass both a national and a state board examination," Thompson said. "Many of the questions on the examinations deal with poisonous plants."

Most veterinary students, however, do take the poisonous plants course, which focuses on the garden and its inedible inhabitants. The course examines the effects of poisonous plant ingestion on beef and dairy cattle, horses, sheep and goats, said Thompson. In addition, exotic animals such as llamas are now also being studied.

Thompson said that the course is not primarily directed at dogs and cats simply because these animals are infrequent victims of poisonous plant ingestion.

"There are fewer deaths associated with poisonous plant ingestion in dogs and cats than there are in the grazing animals, because dogs and cats don't eat plants for food. They just kind of nibble on them out of curiosity more than anything else," he said. "It is uncommon to have a life-threatening poisonous plant ingestion in a dog or cat."

Poisonous plants that cause death...
immediately after ingestion are rare, Thompson said. “A lot of these toxic plants will not cause death in the animal,” he explained. “There’s a whole continuum of clinical signs, from very mild gastrointestinal upset to more severe symptoms. By and large, most of the plants do not cause death.”

Indeed, many of the plants in the garden are only poisonous under certain situations. “Some plants have been found to be toxic in extenuating circumstances only,” Thompson said. “A small amount of these plants in a normal, balanced diet usually will not cause an upset. But if you get extenuating circumstances, then you can have a problem.”

As an example, Thompson mentioned black cherry trees, whose leaves contain cyanide. “Most of the time, you will not have any problems with, say, a horse in the same paddock as a cherry tree,” he said. “The dry leaves are usually not very hazardous, so they fall and the horse eats a couple—no big deal.”

One of more than 100 species of poisonous plants on display in the garden, the boxwood is potentially lethal to horses.

The black cherry’s toxicity, then, hinges upon a very specific set of circumstances. “You need a storm, you need a horse and you need the poisonous plant,” Thompson says.

Another extenuating circumstance involves the amount of toxin ingested. “To paraphrase a famous quote,” Thompson said, “Everything is toxic; it just depends on the dose.”

Apple seeds present an example of Thompson’s rule which can be explained in human terms. Although apple seeds contain cyanide, a 20 to 30 pound child would have to eat more than a cupful to become poisoned, Thompson said.

Just as a cupful of apple seeds would seem unappetizing to the average human, animals too find most poisonous plants unappealing: “Many times animals will avoid the poisonous plants, if given the choice,” Thompson said. In many cases of poisonous plant ingestion, the animal was forced to eat large amounts of a toxic plant, which under normal circumstances it would have avoided.

One reason for such poisonous plant ingestion is insufficient pastures. Cows, for example, can be poisoned by large amounts of nitrates. “A cow can tolerate a certain amount of nitrate in its diet,” Thompson said. “But if you put the cow in a poor pasture and all there is are these high nitrate plants, the cow could be poisoned.”

One exception to this rule of tolerance is the Japanese yew, an extremely dangerous hedge positioned in the center of the poisonous plants garden. One pound of clippings from the yew contains enough toxin to kill an adult horse or cow, Thompson said.

Occasionally, a plant that harms animals poses a threat to humans as well. The white snakeroot plant, located at the back of the garden, ended the lives of many settlers back in the pioneer days. The plant caused a condition called trembles in cows, who then passed the toxin along in their milk.

“Especially in the midwest, almost entire settlements would have a major death loss from milk sickness,” said Thompson. Indeed, the description alongside the white snakeroot plant in the garden mentions that during the 1800s, it killed nearly half the residents of some areas of the United States.

Today, poisonous plants do not pose the same threats as they did back then. According to Thompson, the number of plant poisonings is decreasing, thanks to better agricultural practices and increased education. Cornell’s garden continues to help uncover the secrets of poisonous plants. W. C. Muencher would be proud to learn of the contributions of his venomous vegetation.

by Jennifer Perillo ’93
"IT HAS BECOME PROGRESSIVELY recognized that the fundamental scientific problems of medicine are biological problems... Stimson Hall may continue to be available but with a closer integration of all the biological work of the University."

Following the Board of Trustees' 1938 decision to close the Ithaca division of Cornell University Medical College, but to maintain the New York City facility, Secretary B.F. Kingsbury issued this visionary, if not sober, eulogy in the President's Report.

But the forty-year tale of the medical college in Ithaca did not end entirely. Cornell remained loyal to the building it left behind. In fact, it foresaw a productive future for the sandstone structure which was named in honor of surgeon and Cornell medical educator Lewis Atterbury Stimson (1844-1917).

Opened in 1903, Stimson Hall housed medical laboratories and lecture rooms for 35 years. It supported various scientific research and a total of 1,515 medical students.

During its period as a medical college, Stimson Hall was revered as the most advanced medical training facility in the country. The building was even temporarily converted into an emergency hospital to battle Ithaca's infamous 1903 typhoid epidemic which killed 29 and forced the evacuation of one-third of Cornell's students.

Stimson was chartered in 1898, the same year in which Cornell launched the colleges of medicine in Ithaca and New York City. The University had designed a two-step system for its medical students: The college at Ithaca gave two years of basic science and medical instruction following which students could transfer to the New York City facility to complete their training.

Even at their creation, however, Cornell's sister medical colleges were not equal. Whereas the hospital-college in New York City enjoyed wide funding and space, the college in Ithaca was solely University-supported. Almost immediately, the Ithaca facility's cramped space on the top floor of White Hall became a liability for the instructors and students alike.

Luckily, a University friend came to the rescue; Stimson Hall was chartered through an $80,000 donation by Dean Sage, the son of Henry Sage. The 1902-1903 Cornell Medical College Announcements hailed the completion of the yet unnamed structure:

"...The University has been enabled to erect a building especially designed for anatomy, histology, embryology, and physiology... The general form is that of an E, 157 feet long and 50 feet wide, with wings 40 feet square."

As it is today, Stimson Hall was divided into five floors. The cellar provided a space for storage, embalming and cremation. The first floor held the coat rooms, library and offices. On the second floor students studied histology and physiology. Students dissected cadavers on the third floor and X-rayed bones in the attic.

But by the time Cornell had erected its two medical colleges, the 'old school' of medical education was dying. Both Johns Hopkins and Harvard universities had cut basic science from their curricula to demand undergraduate pre-medical preparation. Educators also saw that medical schools needed adjoining teaching hospitals in order to provide sufficient clinical training.

The result of these new attitudes, according to Morris Bishop's 1962 book *A History of Cornell*, was that the Ithaca division began to feel pressure to pull up its stakes. The situation was expedited by the University's need to redirect its resources toward the booming New York facility. By 1938, all medical instruction was permanently transferred to the New York campus.
Nowadays Cornellians can know only the history of the world that once occupied Stimson Hall. But Cornell administration helped to ensure that the building would embody the University’s landmark decision to create a biological sciences program independent of a medical curriculum.

Following Stimson Hall's takeover by the new Department of Zoology—which has since been absorbed into the Division of Biological Sciences—the building continued to function as a teaching facility. It now houses a portion of the division, which was formed in 1964.

Harry T. Stinson, Associate Director for Academic Affairs and Administration for the Division, said that “the building’s uses have been reshuffled as the Division itself developed and new biology facilities were built, most recently the Biotechnology Building in 1987.”

Stimson Hall is no longer a research facility, he said. Today, classrooms and laboratories share the building with teaching rooms, the Behrman Biology Center, the biology learning skills center, the Division’s academic affairs office, the University ombudsman, an autotutorial study center, and two computer laboratories.

And since 1990, the building has witnessed a new kid moving in next door—the Carl A. Kroch underground extension to the Olin Library stacks—which is marked for completion by the fall of 1992.

The library extension has prompted structural changes in Stimson Hall itself, Stinson said. Half of what was once the ground-floor biology center now contains the stacks elevator. Also, part of Stimson Hall’s north side has been walled off to make room for the extension entrance.

Stinson’s new neighbor marks the beginning of yet another period of change in the building’s 90-year history.

by Jill Steuer ’92
HE’S KNOWN ON CAMPUS AS THE “Frog Man.” But Professor Antonie W. Blackler is just your average Cornell biology instructor with extraordinary frog-rearing talents.

Born and raised in London, England, Blackler received his PhD in biology at the University of London. Blackler first brought his research skills and witty teaching style to Cornell’s former Department of Zoology in 1964. He now teaches in the Section of Genetics and Development in the Division of Biological Sciences.

Blackler has always been involved in teaching biology at the introductory level. He started Cornell’s first introductory biology course for non-majors in 1971. “At the time, there was only one course, that had 1,100 majors along with non-majors. This was too many students,” explained Blackler.

Blackler’s commitment to undergraduates also includes taking time to encourage students to do research. He has worked with many aspiring undergraduate biologists in the laboratory. Blackler’s work is noteworthy in that many professors prefer only graduate students to assist them with their research projects. Blackler earned the title “Frog Man” from the Cornell community because of his renowned expertise and published research on amphibians. “I’ve worked with amphibia of various kinds such as toads from South Africa, horned frogs from South America as well as the native North American ones,” said Blackler. He finds that these animals are easy to house, feed, and raise in the laboratory. “They’re not as good genetic subjects as fruit flies, but I can get them to lay eggs at any time of the year,” explained the “Frog Man.”

“You can cross different species or hybrids to get some unusual abnormalities,” continued Blackler. From certain species crosses, the offspring frogs gain extra sets of chromosomes; others show abnormal sex traits. Many of these laboratory frogs are sterile.

Blackler’s frog studies, now spanning almost forty years, are also inspired by his personal agenda to save endangered species. His work involving species transfer may someday contribute to the restoration of wildlife.

Blackler explained, “One can take undeveloped, immature embryonic sex cells from an endangered species and put those cells into an embryo from an unendangered species, expecting this unendangered embryo to become an adult and produce the sex cells of the endangered species.” Using this technique, Blackler attempts to make unendangered species produce the sperm or eggs of endangered species.

So what does all this have to do with saving endangered species? “Well, if you can transfer those embryo ancestor cells across broadly different amphibia, maybe
"In many countries, frogs are being eliminated by pollution. Tree cutting is destroying their habitat."

you can do this in birds or mammals as well," said Blackler.

Blackler, although affectionately called the "Frog Man," does not himself identify with frogs and never keeps them as pets. Besides his concern for preventing species extinctions, Blackler sees other important applications for his work with these creatures. "In many countries, frogs are being eliminated by pollution and habitat destruction. The destruction and frequency of amphibia is a useful index of the level of atmospheric pollution in South America," said Blackler.

Blackler also detailed the history of frogs in pregnancy testing. "The Xenopus frog was used in the original pregnancy test for women around the year 1937," he added. "They injected urine into this particular frog and if it laid eggs, then the woman was pregnant." This "early rabbit" test was usually repeated with three frogs. If one or more of the three frogs laid eggs, the woman was said to probably be pregnant.

Outside of his work with amphibia, Blackler has a philosophy concerning successful teaching. "There's always an element of the theater involved when teaching before a large lecture. I tend to be more flamboyant and use anecdotes to get the students' attention," said Blackler. Blackler believes that the function of the lecture is to act as a "transfer zone" between teaching and learning. "A successful lecture diverges from what is presented in the textbook," he said. In smaller classes, however, Blackler talks to students on a more personal level and has greater interaction with them.

Blackler thinks highly of European standards of teaching and learning. He strongly rejects pure memorization as a learning tool. "I believe the ability of a student to go beyond memorizing and to apply concepts distinguishes the A, B, and C students from each other," commented Blackler.

As a teacher's final accomplishment, Blackler acknowledges the students who keep in touch with him after graduation as his proudest achievements. "Those students make me feel I've made an impact," said Blackler. "These students who have been transformed by the Cornell experience—in their attitude and critical approach to life—make me feel that I played some part in all this."

Blackler, although satisfied with his work and his relationship with the students and faculty at Cornell, is critical of the lack of effort that the University puts into undergraduate education and facilities, especially in the underclass years. He criticized Bailey Hall for its hard seats, and characterized Warren Hall 45 as a "hot pit"—neither of which have improved since he first arrived at Cornell in 1964.

Blackler may be renowned for his amphibian studies, but this European-bred intellectual also possesses a wealth of insight into what is best for students. Perhaps the frogs, in their own way, find him endearing to be around every day. We humans should be so lucky. ■

by Cozzette Lyons '92
Forest Park: How Ezra’s Farm Became a University

THE LAND ON WHICH CORNELL’S buildings stand was once part of Ezra Cornell’s 300-acre farm. This much is known by most Cornell students, but few realize that Ezra’s incredible foresight and generosity were crucial to the founding of the University.

Between Fall Creek Gorge (which separates North Campus from Central Campus) and Cascadilla Gorge (near Collegetown), lie approximately 300 acres which used to be densely forested until they were bought by the De Witt family in 1793 and cleared for wheat planting. In Forest Park, Stephen Jacobs writes that the farm, bounded on the west by what is today East Avenue and extending more than a mile eastward, remained in the De Witt family until Ezra Cornell and his brother-in-law Orrin Wood decided to buy the land.

Ezra Cornell was a self-made man. Biographer Philip Dorf states in The Builder that Cornell started out as a mechanic and miller in the Ithaca area and engaged in some land speculation during a boom in the 1830s. But when prices fell and his employer, Jeremiah Beebe, for whom Beebe Lake is named, sold his mill, Cornell found himself in need of an occupation.

He became a farmer on the land he had leased north of Fall Creek. Cornell raised sheep, cattle and hogs. He experimented with breeding to improve his herds, and would not hesitate to spend the money on a quality breeding animal. Cornell knew that area farmers could have higher herd yields if they crossed their stock with better breeds, but he found it hard to convince them of this.

According to Albert Smith in his biography, A Character Study, Cornell recognized a need for agricultural education early in his life and determined that he would someday help farmers improve their lifestyle. Cornell had educated himself largely through books and he thought that the farmers of the area should have access to the latest agricultural knowledge. His first step, one that gained him recognition as a farmer and a community leader, was helping to refound the Tompkins County Agricultural Society.

But Cornell would not stay on the farm for long, for he became involved in the newly-invented telegraph and followed its development, wrote Dorf. Cornell foresaw a revolution in communications and wisely became one of its foremost proponents. Not many people in those days believed that the telegraph would be a success, but Cornell promoted it, invested in it and helped to develop telegraph technology. When Cornell finally decided to retire on a farm in Ithaca in 1857, he was making his fortune from the telegraph, and was in a position to finally buy the De Witt farm from his brother-in-law.

Cornell bought the property, named it “Forest Park” and settled his family in the large farmhouse, which was located on what is now Stewart Avenue. With his financial burdens relieved, Cornell was free to pursue agriculture in earnest. Once again, he set about improving the standards of agriculture in Tompkins County, raising a purebred herd of short-horn cattle and purchasing pedigreed Southdown sheep and Berkshire pigs. At this time, he found area farmers more receptive to the idea of breeding stock.

Using census figures, Cornell calculated the rising butterfat average of the county’s cattle as one indicator of the area’s agricultural success. He encouraged not only the farmers of Ithaca, but those in other areas of the region, to improve their crops and livestock by learning new farming methods. His farm became a model of production and Cornell assumed a position of leadership in the community as president of the county agricultural society and the founder of the Farmers’ Club of Ithaca.

His accomplishments were noted by others in New York state as well. Cornell gained a great deal of political stature. He was elected president of the New York State Agricultural Society and served as chairman of the Committee on Agri-

The farmhouse where Ezra Cornell lived for twelve years. The building was destroyed by the University in 1965.
culture. In 1861 he was elected to the State Legislature.

Cornell wanted to use his position to improve the general education of the public. With the fortune that he was bringing in through his Western Union stockholdings, he built a free public library on the corner of Seneca and Tioga streets. The library, generous gift though it was, would be overshadowed by the larger gift Cornell would make through his own wealth.

Cornell never intended to create a new college. He lent his support to the newly-created New York State Agricultural College at Ovid as a trustee, but the college would see less than one year of service, Dorf's biography states, because of the outbreak of the Civil War. The college would never reopen because of its financial difficulties, yet Cornell began a campaign to save it by requesting land-grant money through the Morrill Act of 1862.

According to Gould Colman ’51 MS ’53 PhD ’61, University Archivist, the Morrill Act “allocated federal lands to each state with the stipulation that profits derived from their sale would be assigned to colleges teaching the subjects of engineering, agriculture and military tactics. New York’s share of the federal land grant was huge—about ten percent of the whole based on its large number of representatives in Congress.” Cornell tried to gain part of those benefits for the Agricultural College but those efforts failed.

It was at this time that Cornell met Andrew Dickson White, chairman of the State Education Committee and fellow senator. Cornell and White, though opposite in background and temperament, shared a common interest in education. White was a great believer in the classical education with which he had been privileged, while Cornell desired to extend knowledge, especially agricultural, to those who could not afford it. Together they formed a plan to relocate Ithaca’s Agricultural College, and presented it before the State Legislature.

Smith's book chronicles the controversy over Cornell and White's request to buy the state's entire land grant to fund what would be known as Cornell University. Among other charges, Cornell was accused of speculating for his own gain. Despite his well-known philanthropic nature and the many gifts he had given to his own town, his motives in founding the university were questioned by some.

Eventually, the doubters were silenced and after legal wrangling with the state, Cornell was permitted to buy up all of New York's land grant. Not only did Cornell offer up $500,000 of his own fortune to buy the land grant and hold the profits for the University endowment, but he donated his own farm as the site on which to build the college campus. Cornell's financial experience had apparently taught him much, for the land's value increased to over five million dollars. Cornell University opened its doors in 1868, and today, his gift continues to endow the school.

The University stands as a monument to a man of service and charity. The story of its founding does not reveal selfishness in Ezra Cornell's character, but rather the unparalleled generosity and benevolence that have educated and strengthened people for more than a century.

“Ezra Cornell wanted to improve farmers' lives by extending agricultural knowledge to those who could not afford it.”

by Jeanne Naujeck '92

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Early map showing Cornell's farm land and early layout of the University.
MANY ALUMNI PROBABLY remember the ag quad the way it was in 1950 when gigantic American elms lined the way to Mann Library. These magnificent trees were planted in two rows back in 1932, to provide a canopy over the east-west entrances to the library. But in the 1960s, Dutch elm disease devastated the American elms throughout the Cornell campus, and in 1974, the last American elm was removed from the ag quad.

Professor Marvin I. Adleman, then head of the Landscape Architecture Program, held a student competition to select the best design for replanting the ag quad. A senior landscape architecture student, Donald Vita '77, won the competition with a design that called for informal groupings of trees and species diversity.

"We didn't want to ever risk having the ag quad become bare again as a result of one disease, so species diversity was an objective," Adleman said.

"Alumni and friends of the College of Agriculture and Life Sciences provided the funds to plant and dedicate trees in honor of, or in memory of, friends and loved ones," Adleman added. The trees planted in 1979 included red oak, sugar maple, red maple, American linden, purple ash, tulip, European ash, littleleaf linden, Kentucky coffee and several cultivars of honey locust.

The trees have done so well in the east end that it is hard to believe the quad was barren less than 13 years ago. As Adleman said, "The oak trees in particular have found the site so suitable that they have grown beyond our expectations. They look like they have been there many more years than they actually have."

But the trees were planted only in the east and central areas of the ag quad, leaving the west end sparse in anticipation of the construction of the new Roberts and Kennedy halls. The Ag Campus Beautification Committee, headed by Adleman, was established by the dean's office to develop short-term and long-term plans for the beautification of the ag campus.

According to Kenneth E. Wing '58, associate dean of the College, "The first priority was a design for the commemorative trees for the west end of the quad. The funds have been accumulating over the past ten years for these commemorative trees, but we couldn't plant any until Kennedy Hall and Roberts Hall were completed."

In 1987, construction of the new buildings began, and Adleman took an active role in protecting existing trees on the quad. "I play an advocacy role in championing the cause of trees," he said. "I've been actively involved in promoting tree protection standards for the College and the University."

When construction was completed in 1990, Adleman and the committee designed a new plan to finish planting commemorative trees in the west end of the quad. According to Maya L. Gasuk, Assistant Director of Development for the ag college, alumni and friends gave gifts to the College after the first planting in 1979, for the purpose of dedicating trees in the next planting.

Adleman said his new plan continued the concept of informal tree groupings and species diversity—a design already established in the east and central areas of the quad.

In addition, the dean's office requested that the plan include a large open area in the center of the quad to accommodate tents for commencement, receptions, reunions and other social events, Wing said. "That also provides a space for students to play frisbee, eat lunch, study or just sit in the sun," he said. "We think that's an important part of the quad."

With this consideration in mind, Adleman selected 15 trees from the Halka Nurseries in Easton, New Jersey. His list included two Thundercloud plums, six pagoda trees, three Silver lindens, three zelkovas and a Kentucky coffee tree. Three additional trees were selected from other sources and planted at the same time.

The trees were five to six inch caliper with root ball diameters of up to five feet, Adleman said. "Normally, you want a plant pit two and a half times the
diameter of the ball. I simply made it three times, to enhance the growth of the trees,” he said, adding that because of the maze of utilities under the ag quad it was often difficult to dig a perfectly circular hole for each tree.

The maze of utilities under the quad includes steam, water, gas, electric, telephone and fiber optic communication lines as well as sewer pipes and many others, Adleman said. “We often wind up planting in the small leftover spaces between utility lines.”

David Burnett, facilities engineer with the Department of Facilities and Business Operations, spent four days locating the utilities. Cayuga Landscape Company, a firm headed by David Fernandez '78, a former student of Adleman's, submitted the lowest bid and was contracted to plant the trees in April, 1992.

President Frank H. T. Rhodes and many honorees and donors attended the dedication ceremony for the new trees on May 16, 1992. But only 14 of the 18 commemorative trees were dedicated at design for the west end of the quad called for four commemorative wooden benches outside Roberts Hall and a new walk between Tower Road and Van Rensselaer Hall. The work on these additional projects was completed in the spring of 1992. Two of the four benches were installed and dedicated; the other two are available for dedication.

Adleman said the committee has other long-term plans, but he added, “Things are only long-term until somebody funds them and then they become immediate-term.

“The most immediate need in the ag quad is adequate lighting,” he said. “From a life safety standpoint as well as from an aesthetic standpoint, it’s a real concern. An important part of our plan is to properly light the quad—but that must be given a higher priority.”

The committee’s long-term plan for the ag quad also includes other improvements. For example, Adleman said the walk system needs to be revised to accommodate new circulation patterns.

“Right now the paths don’t always go where the people go, and that is obvious from the muddy trails in several places,” he said.

In addition, the committee is considering creating a plaza in front of Mann Library, where students can sit and read. It also wants to spruce up the entrances to buildings on the quad and create additional display gardens along Tower Road, Adleman said.

But for now Adleman is content to watch the latest commemorative trees grow. “Every few years we’ll come through and raise the canopy by removing the lower branches to try and get that column and canopy effect back,” he said. The ag quad may never look the way it did when the American elms towered overhead, but the committee’s plan promises to return beauty and splendor to the once-barren quad. As Associate Dean Wing said, “We’re putting together a comprehensive plan to have the most beautiful quadrangle of any ag school in the world.”

by David W. Marston '92

A Fresh New Look: This plan for new commemorative trees in the west end of the ag quad was designed by Marvin Adleman. The west end was barren for a number of years while Roberts and Kennedy halls were completed.

13
Avian Airways

AS THE FALL MONTHS GROW COLDER, masses of birds fill the airways and start their journey south. How do these birds find their way back and forth? A startlingly complex array of natural cues, combined with the birds' inborn abilities, act as a system of road signs to help the birds home.

Researchers at Cornell University are unraveling the mystery of bird navigational techniques. Dr. Charles Walcott PhD '59, Professor of Neurobiology and Behavior, and Executive Director of the Laboratory of Ornithology, recalled that bird navigation was once thought to be a simple question of flying north and south. However, birds' travel plans have been found to be not so random. By tagging birds caught in fine mist nets, researchers found that the same birds returned to the same breeding and wintering grounds year after year.

"It isn't just a question of north and south," Walcott explained. "It's I winter in Belize, how 'bout you?"

Navigating the path from a farm in upstate New York to a farm in South America is no easy task. Migratory birds must have some way of locating their destinations. While the birds' exact mechanisms are still a puzzle, scientists have found that the birds rely on a combination of physical cues, such as the location of the sun and stars, smells and magnetic gradients. Researchers have found evidence of these cues by studying migrant birds, and homing or racing pigeons which are bred to return home.

"You can take a homing pigeon out in any direction hundreds of miles from the loft, and it will circle around and fly back," said Walcott. He noted that the birds must accomplish two things in order to find their home lofts. First, they must figure out in which direction home lies. Second, they must use compass cues to make sure they fly in that direction.

Birds use a variety of compass cues to orient themselves. Walcott called it a "sort of belt and suspenders approach." If conditions are not appropriate for using celestial cues, for example, birds may still be capable of using their sensitivity to magnetism.

The cues migratory birds use to orient themselves are quite extraordinary. Numerous studies have shown that birds can orient to sun patterns in the day, including the glow that follows sunset. The birds can compensate for the sun's apparent movement through the sky by using their internal clocks.

Birds can also orient themselves in relation to star patterns. Dr. Stephen Emlen, Professor of Neurobiology and Behavior, conducted an elegant study inside a planetarium. He found the birds knew to use key stars—such as those near the North Star—as guideposts when traveling. The birds then learned a reference pattern, so they could choose their direction in relation to these key stars as constellations moved across the sky.

Of course many areas do not always have clear skies—as Ithacans can attest. What other ways can birds use to orient themselves? Walcott has followed up on a discovery by the late Dr. William Keeton PhD '58, who found that homing pigeons can use the earth's magnetic field as a compass, but only did so under overcast skies.

Except in areas where the rock formation has been disturbed, the magnetic field runs along the planet on a north-south axis, forming gradients of intensity. Walcott and his colleagues found that pigeons from certain lofts became disoriented in areas where the magnetism was irregular, until they found their way out of the affected area. Pigeons from other lofts flew through the irregular areas without any problem. Walcott pointed out that the current suspicion is that "Birds raised in magnetic gradients learn about them, and find them useful in navigation."

Several theories attempt to explain just how birds can sense the magnetic field. Studies have shown that pigeons, for example, have deposits of magnetite in their heads and necks, which may make them sensitive to magnetism. Researchers have also found indications that the birds' visual systems may be adapted to noticing magnetic cues. Walcott explained that the retina is adapted to "see the field. You can put an electrode in the optic nerve and find cells that change their firing rate in response to changes in magnetic intensity," he added.

Some pigeons use their sense of smell to find their way home. Italian researchers found this out by numbing their birds' sense of smell with an anesthetic and releasing them: the birds were indeed disoriented. When German researchers tried the same study with their own birds, however, Walcott said, "The Frankfurt pigeons clicked their heels, saluted briefly and flew straight home."

What could have explained this difference? Well, the German birds were raised in lofts which were protected from wind currents, so they may not have been
sensitive to different smells. By raising a new group of pigeons on a building roof, where they were exposed to breezes, German researchers proved this theory of the connection of smell to orientation. Birds which could not smell could not orient either.

While migratory birds do use many of these cues in various combinations, they face a much different task than does the homing pigeon. Pigeons are trained to go home, whereas migratory birds are not. Emlen noted that migratory birds leave their breeding area of their own volition and travel from 2,000 to 4,000 miles. "They have no motivation to return for six months, then their inclination to return home engages," he said.

"For 90 percent of the trip the bird is not trying to go home. Maybe at the end there is a shift into homing," in other words, for most of the trip, migratory birds use their navigational techniques simply to stay on their programmed course.

Emlen explained that migratory birds have a built-in program for migration; they innately know to fly for a certain number of hours in a certain direction. He described an experiment in which he compared three closely related species of birds which were known to fly very different distances by placing them in cages and preventing them from migrating. "They start nocturnal activity, emulating actual migration," he said, "and the species that flies to Florida stops first, followed by the one that flies to Central America and so on." This behavior alone can bring the bird very close to its final destination.

One of the most important physical conditions a migrating bird must concern itself with is the weather. It must be able to adjust if it is blown off course. Emlen complimented their skill in meteorology. "Birds are probably much better than our TV weathermen," he said. "They pay attention to winds and they correct their position. It's like sailing. You turn the bow past the point you want to reach and get blown in the correct direction."

Birds also pay attention to weather fronts which are associated with predictable winds. This way they can generally fly with a tailwind, and save precious energy. Emlen noted that "There is a very strong selective pressure for the ability to detect winds. The birds stay on the ground until conditions are favor-

able. If the bird meets a headwind, it
lands." This skill has important conse-
quences for birds from the eastern U.S.
who fly across the Gulf of Mexico, a 600 mile stretch with no place to land.

"In early fall, cold fronts sometimes peter out and the birds encounter a headwind over the gulf," Emlen said. To reach land they have to use up all their fat reserves and then some. The birds struggle onto shore thin and weak. "You can just pick them up, because they are too weak to fly away."

Luckily, migratory birds are adept at evaluating winds. Emlen's research team had the opportunity to trace birds using NASA's rocket tracking radars. "You can see the images of birds," he expounded. He explained that the group would attach a radio transmitter to a bird's wing, release the bird from a weather balloon way up in the air and then track it. "We learned that if the bird is released in an altitude where the winds are not favorable, it will sample other altitudes until it finds a good one," Emlen said.

Once migratory birds complete the bulk of their journey, they still have to home in on their exact destination. Walcott noted that very little is actually known about the birds during this stage of the journey. Emlen suspects they may shift into a homing phase near the end of the flight. "I think migrants are playing with the same cue systems as pigeons or other animals," he stated.

Of course intermediates do exist. Some birds, such as swallows and seabirds, travel tremendous distances in a single day while searching for food. These birds need homing abilities in order to return to their nests. Therefore, homing and migration do not necessarily go hand in hand. Scientists still have much to unravel in the great bird navigation mystery. One thing, however, is certain. It's something to marvel at while watching the flocks fly overhead this fall. 

by Melissa Glim '93
CORNELL CAN BOAST SEVERAL WELL-ESTABLISHED FRESHMAN TRADITIONS—Mandatory swimming tests, the dreaded first prelims and the line at Hot Truck, to name a few. Freshman biology students can add a new experience to the list, courtesy of “Explorations,” a program developed by the Division of Biological Sciences.

“Explorations” invites freshmen to leave the classroom and enter a Cornell lab for hands-on exposure to research on the cutting edge of biology. Every student in the introductory class for prospective biology majors must attend at least one “exploration” in a Cornell research lab. In the program, students work alongside faculty members whose specialties range from the naked mole rat to human infertility to necropsy, the study of the dead. In 1991-1992, more than 70 faculty members opened their lab doors each semester to the approximately 700 students who took the course.

The project is the brainchild of Jeffrey Kidder, a PhD candidate in zoology and a former teaching assistant for the course. Kidder said the idea came to him when he started a volunteer trip to the Cornell Plantations several years ago. Few students in the class knew about the Plantations and Kidder said he realized that many of the University’s resources were going unused and unnoticed.

“A lot of undergraduates aren’t aware of all the resources on this campus,” said Kidder, who won a 1990 Outstanding Teaching Assistant Award from the College of Agriculture and Life Sciences. “Their world very much focuses on the dorm, the dining halls and Collegetown . . . they’re not really a part of the larger sphere of the University,” he said.

Kidder, a former high school teacher, took his idea to Jon C. Glase ’67 PhD ’72, a senior lecturer in the Section of Neurobiology and Behavior. Glase coordinates the labs which accompany the course and helped turn Kidder’s idea into a reality.

The first hurdle was finding out if faculty members would volunteer their time and their labs to freshmen. Kidder said he and Glase surveyed “anybody who had any remote connection” to biology. “I really tried to sell them,” he said. “Many people came back and said ‘Great idea. Count me in.’”

The three-year pilot project began in the fall of 1991 and is funded by a grant from the Ford Foundation Undergraduate Scholars Program, through the Office of the Vice President for Academic Programs and Campus Affairs.

Participation in the program counts as three percent of a student’s grade in the introductory biology course. Students are guaranteed credit for attending, as long as they hand in an evaluation sheet. The most common response from students, Kidder said, is that they usually ask if they can attend more than one exploration per semester.

At the beginning of each semester, students receive a booklet listing the choices for Explorations. Students pick their top seven choices from the more than 70 offerings. Some explorations are more popular than others, but during the spring 1992 semester, 93 percent of the students were matched with one of their top three choices and 74 percent got their first choice, Kidder said. The booklet for the spring 1992 semester listed 72 different choices. The average exploration accommodates about 10 students and some are limited to as few as two freshmen.

One of the most popular lab experiences last spring was certainly not targeted at those with weak stomachs. “The Necropsy—Key to Living,” conducted by Prof. John M. King, veterinary pathology, attracted 40 students. Those 40 were the lucky ones—150 students ap-
plied for a spot in King's lab, which, according to its description in the booklet, allowed participants to handle "actual fresh but pathologically affected organs and tissues" from dead animals. King said he led the students through a "storytelling" session, where he displayed diseased organs from dead animals and explained why and how the animals were affected by their illnesses. Although students were allowed to touch the diseased organs, many declined the opportunity. "If they [want to] take time to touch it and look at all of it, there are gloves available," King said.

Daniel S. Zuckerbrod '94, who attended King's exploration, called the experience "gross," but entertaining at the same time. "We trekked up to the vet school and we watched as this guy held slabs of parts of animals on this big metal tray," Zuckerbrod said. "It was interesting... I had never seen anybody take parts of animals and just rip them up."

For students who are unsure of their eventual field of study, the Explorations program offers a close-up look at a wide range of specialties and may take students in directions they never knew existed. "It gives you an idea of what you want to major in," said Daniel Rabinovitch '95. Kidder said that some freshmen enrolled in upper-level courses for further study in the field they explored, while others became so interested in the topic they explored that they now work in the lab they visited.

The Explorations program may come as a blessing to freshmen who feel lost in one of Cornell's largest courses. Almost 800 students started the introductory class in the fall of 1991 and just under 600 followed through to the spring of 1992. "Large introductory courses are an unfortunate situation. I think it's not a good teaching method... a lot of students get lost in the cracks," admitted Prof. Carl D. Hopkins, neurobiology and behavior, who taught the class in 1991-1992. "When Jeff [Kidder] proposed this idea I was very enthusiastic about it and urged him to go ahead." Hopkins said the Explorations program is a step in the right direction, since many "students have been anesthetized by large classes."

"It was nice being in a smaller group," said Traci R. Vogel '95. "It kept me more attentive."

The program not only puts students in a smaller setting, but also gives them a glimpse of the research being conducted in labs University-wide. The typical freshman does not usually come in contact with Cornell research and may have no idea of its size or scope. Glase said that in regular labs, students often repeat studies that have already been done, but when they work alongside a University researcher, they are "at the frontier of current knowledge."

"Cornell University is a research university," Hopkins said. "The purpose of the Explorations program is to say, 'This is what we do. This is what goes on here. This is Cornell.'"

In order for the program to continue, professors and faculty members must be willing to continue volunteering their labs. Most faculty members who participated in the program said they would be willing to do it again. Prof. Robert H. Foote, the Jacob Gould Schurman Professor of Animal Physiology, and Xiangzhong Yang, a senior research associate in the Department of Animal Science, invited about eight students to learn more about early embryo development through hands-on research. Students learned modern procedures on equipment being used in current research. Foote said the Explorations program exposes students to areas they might be interested in and also lets them know that he and other Cornell faculty members are accessible.

Freshmen also get the opportunity to see scientists in action. Students learn what a research lab is and what a scientist really does, Kidder said. "They recognize that these people are human beings," Foote said.

But would students be exploring Cornell's research labs if they weren't required to? As Rabinovitch said, "I probably wouldn't end up doing it, but I'm glad I was forced to do it."

by Jill Rackmill '93
What's the Buzz?

Professor Morse removes a colony of honey bees to get a closer look. He is trying to develop a strain of bees resistant to destructive varroa mites.

If the sound of buzzing and the sight of yellow and black stripes makes you a little nervous, you might want to avoid the stretch of Cornell property along Freese Road in Ithaca.

Home to the Dyce Laboratory for Honey Bee Studies and Liddell Laboratory of Animal Behavior, this area is a hive of activity for honey bee research—from practical beekeeping to colony behavior to the uses of honey.

“The study of honey bees is a small area. There are only a few of us who work with it so we're very adaptable in terms of our research,” said Roger A. Morse '50 MS '53 PhD '54. A professor of apiculture in the Department of Entomology, Morse has been the sole faculty occupier of Dyce Laboratory since it was built in 1968.

In addition to his teaching and research, Morse has extension responsibilities—so, much of his work centers around practical beekeeping methods and problems. He focuses on reproduction and social order, but he has also developed a honey wine production process, studied “killer” bees and worked with Cornell food scientists on the use of honey to keep apple juice clear.

Recently, he and K.H. Steinkraus, professor emeritus, have studied the control of a honey bee disease-causing mite, *Varroa jacobsoni*, in the United States and abroad. This destructive mite, found in the U.S. in 1987, has killed thousands of colonies of bees. Some colonies in infested areas have survived, and Morse, with the help of outside beekeepers, is working on breeding them to develop a resistant strain. “It will probably take three to five years to achieve this, but it is preferable to chemical control, which can be costly and time-consuming,” he said.

He explained that the resistance mechanism is quite simple. “The bees groom off, bite, maim and carry the
mites outdoors. It's easily observed. You can't ask for anything better."

Though Morse receives a large number of phone calls and requests for information on beekeeping methods, honey processing and beeswax, he jokes that he doesn't have many visitors. "Because there are always a number of bumblebees out front, some people are afraid to come visit me," he said.

However, he does have a few close neighbors who aren't scared off—the researchers just down the road at Liddell Laboratory. Thomas Seeley, associate professor in the Section of Neurobiology and Behavior, and Scott Camazine, one of the section's PhD students, have both worked with Morse on a number of occasions.

Seeley and Camazine research bee behavior rather than practical beekeeping. "To me, the bee is fascinating because of its rich social behavior," said Seeley. "The study of the honey bees can answer some basic questions in biology about animal societies and animal communication."

About half of their research is done at Liddell lab which has been set up with indoor glass-walled observation hives that connect to the outside so the bees can come and go freely. The other half is done in the Adirondack Mountains where few flowers grow, so researchers can control food sources.

Seeley is studying how a honey bee colony as a whole chooses where to collect its food. "Food sources vary tremendously in size and profitability," said Seeley. "The colony is faced with the problem of deciding where its foragers should go. The most foragers should be sent to the largest, richest source."

When a forager bee finds a food source, it returns to the hive to gather recruits. It communicates location by doing a "waggle" dance; direction is indicated by the bee's orientation in the hive, distance by duration of wagging and quality by the number of circuits in a dance—the better the source, the longer the dance.

Originally, researchers believed that bees compared dances going on in the hive and selected the best source, said Seeley. But he found that each bee chooses a dance at random and follows it. More bees go to the richer source simply because more are likely to encounter the longer dance.

"The deeper message here is simplicity," explained Seeley. "Each individual operates with limited information. No one is overseeing the process, but organization arises."

He said these control processes parallel those of many other organisms, down to the cellular and molecular level. "Order often develops from individual components responding to local cues," he continued. "In studying bees, we are learning something general about biological organization."

Camazine's related work increases understanding of how bee colonies work as a whole. He has studied how colonies regulate intake of food sources to achieve the right balance for nourishment.

Bees collect two types of food: nectar, a carbohydrate for energy; and pollen, a protein for nourishing growing bees. They default to collecting nectar unless pollen is needed. So how do the foragers know what to do each day?

"Imagine you had to buy milk for everyone in the Empire State Building," Camazine explained. "You would need some sort of a system. But one bee cannot keep track of the whole colony."

He has discovered that bees indirectly, rather than through direct observation, figure out how much pollen is stored in the hive. Nurse bees, who feed the brood, will feed pollen to foragers also if enough is stored. If there is a shortage, foragers go without. When the bees feel hungry for the protein in pollen, then they know to collect more.

Camazine has also used mathematical computer models to figure out how the placement pattern of honey and pollen in the hive arises. Although the honeycomb looks organized, he said, "Bees don't know where to put things. The honey and pollen near the brood get eaten quickly. A pattern is formed only by the way things are taken out."

"Bees are dumb," Camazine claims. Seeley argues this point with him; he thinks they are poorly informed, not dumb.

Regardless of the debates between bee researchers, the rest of us know one thing for sure—bee stings hurt. Most of us probably would worry about working so closely with bees, but the researchers do not mind. How do they feel about the hazards of the job?

"People who are not stung frequently just don't understand how small the problem is," said Morse. "Commercial beekeepers may get stung from ten to one hundred times a day, and it doesn't bother them. It's not the kind of thing bee handlers talk about when we get together. We just don't worry about it much."
BIOLOGICAL WASTE MANAGEMENT is a challenge faced daily by Professor William Jewell and his associates in the Department of Agricultural and Biological Engineering, at Cornell's College of Agriculture and Life Sciences.

The mission of principal investigator Jewell's waste management projects is to investigate approaches to waste management problems that do not involve chemical engineering. Said Jewell's research associate Bob Cummings, "We look to take advantage of what nature's already doing ... you'll find that natural

In an effort to find solutions to this new problem, the Gas Research Institute of Chicago, Illinois funded the "Energy and Biomass Recovery from Wastewater" project in a greenhouse next door to Ithaca's sewage treatment plant. With Professor William Jewell as principal investigator, researchers set out to treat raw sewage by constructing an artificial wetland with plants grown in a hydroponic setting. They found that the plants' roots filtered out and retained suspended solids, and took up dissolved nutrients.

Researchers are currently in the process of writing up their final report; but even now, Cummings estimates that Jewell receives at least three phone calls per day from around the world, from farmers to members of small communities, who are interested in constructing their own artificial wetlands for sewage treatment.

This hydroponic sewage treatment project has also interested the gas industry, but for a different purpose. Research support specialist Brian Richards is currently working in the greenhouse on an extension of the last project which would benefit primarily the ecological situation of gas companies. In another project, research support specialists Yarrow Nelson and Donna Fennell are completing work in Riley-Robb Hall also aimed at industry—in particular, users of chlorine-laden solvents.

Both projects are concerned with reducing the toxicity of chemical waste, though Richards' project is concerned with reducing the volume of waste before dumping, and Nelson and Fennell's projects are aimed at cleaning up a mess that's already pervaded America's drinking water. The newness of Richards' project, begun this year, indicates not only that gas companies are becoming more interested in keeping the environment clean; but, as Richards said, that environmental regulations are tightening.

"There are spinoff environmental problems when you drill for and produce natural gas," said Richards. Side effects include "produced waters" which emerge with the gas and are hazardous due to their high salt content. These waters, said Richards, have in the past been trucked to treatment sites for evaporation in lagoons, or surface dumping. "There is no easy way to drop out the salt," he said.

As an alternative solution, however, the proposal for this new project consists of the use of halophytic (salt-tolerant) plants in increasing evaporation rates, resulting in a smaller volume of a more concentrated waste. Currently, a small-scale system is set up in the greenhouse consisting of several channels.

At the first-stage channel, full of cattails, water with a salt content equal to that of the "produced waters" is introduced from a tank. At the second-stage channel, full of smooth cordgrass (a salt-loving plant), water with a salt content of up to four times the previous amount is introduced. In the last channel, filled with various plants, the salt content is moved up to ten times that of the water introduced into the first stage.

The object of the project is to find out whether or not the plants actually speed up the evaporation of water, by bringing the water up their stems and out their stomata into an "evaporation-friendly environment."

In the process, Richards will also
discover which particular plants are happy to do this. Richards said that the cattails have grown to only one-third of their normal height. He characterizes them as salt-tolerant—not salt-loving like the cordgrass, which actually has salt glands on its leaves which release salt pure enough to eat, as Richards demonstrated.

As the project progresses, Richards might look to a bit of engineering technology in the form of air jets, to increase evaporation rates further by blowing air up through the canopy. In comparison with an open-water control channel, the project has already shown that the plants do speed up evaporation rates. As well, tests of water in the "before" and "after" tanks have shown that the salt concentration increases after passage through the channels; the plants have done their job by releasing water for evaporation and reducing the amount of liquid waste. The final result of this process on a larger scale would be a greatly reduced amount of water with a very high salt concentration. Richards estimated that at that point, remaining water might be boiled off, leaving less mass to truck to a lined landfill.

Fennell and Nelson, two researchers at the department's lab in Riley-Robb Hall, have been working together under the direction of Jewell to use bacteria in bioremediating spills of toxic solvents, such as those used for degreasing or dry cleaning. These solvents have been spilled into the earth after train wrecks, and after use in households and industry. They are extremely potent: even a five gallon spill can contaminate many square miles of groundwater.

But research in the ag college should be helpful in cleaning up some of the more than 1,200 sites in this country that have been affected by millions of gallons of such spills, and designated by the Environmental Protection Agency as having severe toxic waste problems. The EPA's Superfund effort began in 1980 to clean these areas up, at the expense of industry. Therefore, industries are looking for cost-efficient ways to clean up after themselves, and funding researchers like Jewell to teach them how.

The biological slant on cleaning up expectedly cancerous chlorinated compounds, found in these solvents, lies in using bacteria to do so. Nelson and Fennell have built versions of a Cornell-patented device called an expanded bed, to measure the effect of anaerobic and methanotrophic bacteria on the compounds. Nelson said that these compounds were thought to be non-biodegradable until 1985.

The expanded bed increases the amount of contact the wastewater has with the bacteria, which stick to bits of sandy earth, according to Nelson. Air is pumped up through the device, stimulating that contact. Said Nelson, "The enzyme the bacteria use to break down food is also the one that breaks down toxic compounds—an accident of nature which we're trying to capitalize on."

He continued, "A key element of the expanded bed process is the combined use of anaerobic (specifically methanogenic) and aerobic (specifically methanotrophic) bacteria. The actions of these two types of bacteria are complementary, meaning that together they can break down a wide variety of toxic compounds.

"This is analogous to a natural wetland, which is anaerobic down in the muck and aerobic near the surface—this is one of the reasons why wetlands provide pollution control," he said.

With hope, the combination of these two bacteria will be successful in the first pilot-scale construction of expanded beds at the Department of Energy's Savannah River nuclear weapons production plant in South Carolina. Results of this pilot project will be available in 1993.

Research support specialist Yarrow Nelson with his methanotrophic reactor. Bacteria inside the reactor eat away at toxic solvents.

Meanwhile, at Cornell, Jewell is preparing to publish as his role in the project ends.

The agricultural and biological engineering department is very optimistic. Said Fennell, "This is one of the largest-scale studies which has demonstrated that this particular biological process will work. We are optimistic that larger-scale demonstrations will be successful."

by Gretchen Leigh Metzger '92
A CONVERSATION WITH THE ARCHIVIST

WHILE DOING RESEARCH FOR AN independent study project at the Cornell University archives, I came to meet and to enjoy interesting conversations with the archivist, Gould P. Colman. It was always a pleasure to ask Mr. Colman a question about archival material because an interesting anecdote usually came with the answer.

Colman '51 MS '53 PhD '61 has worked for the University as a historian for the College of Agriculture and Life Sciences, and as director of the Cornell Program in Oral History. He is the author of the book, Education and Agriculture, A History of the New York State College of Agriculture and Life Sciences.

Countryman: How did you come to be the University archivist?

Colman: I came to Cornell and studied history; all my degrees are in history. After completing my undergraduate work I worked in the University archives as an assistant archivist because I needed a job.

Countryman: So you got your masters degree...and then went on to a PhD?

Colman: A lot of archives work is materials handling—I wanted to spend more time looking in the boxes! So in 1954, after working at the archives one and a half years, I started PhD work. I sort of fell into it; I had no plan. Also Ithaca was—and is—a nice place to live. I got hold of 50 acres in 1954 about three miles from Ithaca. I have been able to do more in Ithaca than I think I could have done elsewhere.

Countryman: How do you “sort of fall into” a PhD?

Colman: Well, I wasn't planning to do the thesis. One day a colleague was talking about his brother's experience at the Putney School in Vermont—an alternative school that integrated academic learning and farm activities. The assistant headmaster was going off to remodel another school along Putney lines. I applied and was there three years. The chairman of my department urged me to do a centennial history of the College of Agriculture as my thesis. By the third year I was taking on administrative work, which I disliked, so I came back. Later on, the ag college offered me a chance to do some fascinating work in oral history. I documented the beginning of artificial insemination in the U.S., among other things, and one could already see the implications then for human beings.

Countryman: How did you become interested in the College of Agriculture and Life Sciences?

Colman: Through the writings of Liberty Hyde Bailey. His idea of a rural civilization appealed to me. There was no clear course, though, by which I became interested in the College. As a child, I grew up in a family that was not formally religious, but on Sunday mornings my father and I would walk around the farm and pull up the plants, look at them and at the animals and speculate about why they were growing as they were. There were rarely answers, but it was fun to ask the questions.

Countryman: Are you still involved with the ag college?

Colman: Sure. In 1965 I moved to the University Library while continuing to study farm families as I had done in the College. I have lots of information in the form of interviews that I am working into a book. I am looking at what has not changed in farming, why farming has remained family-based. How do we get this incredible productivity? I am also looking for patterns among Iowa and New York farmers and I'm finding them—they are unmistakable. They show how producing crops and animals is integrated with reproducing farming families.

Countryman: You mentioned Liberty Hyde Bailey earlier.

Colman: I thought I was going to be the world's greatest secondary school teacher and do what Liberty Hyde Bailey did! I feel like I have studied with him—I have read thirteen cubic feet of his mail in the archives! He linked human life with the evolution of cultivated plants and domesticated animals, and investigated the connection between the days and lifetimes of both. Bailey wanted to gear people up, as the American Indians do, to live in sync with the rest of nature. Of course our environment is built, but the builders should be informed. He recognized that education in agriculture would only help society by keeping the long term in view.

Countryman: Bailey was the founder of this magazine.

Colman: Yes, it was originally written by faculty for an informed audience of students and faculty. Then, they started shipping it out to alumni. It started out with Bailey. Later, Bristow Adams, a major figure in journalism, oversaw it and other ag college publications. He had a corps of assistants that would go through faculty manuscripts, preparing them as experimental station or extension bulletins.

Countryman: What do you think of the modern Countryman magazine?

Colman: It works well as a tool for students. Of course, it is a very different publication today, but how does one recreate what the Countryman did in 1903 or 1904? Is it even possible? Does the audience exist? Would one even want to?

by Mary-Jo G. Stewart '92
Outstanding Alumni Awards

Six alumni of the College of Agriculture and Life Sciences were honored at the 1992 Alumni Awards Banquet in October. Five Outstanding Alumni Awards and one Young Alumni Achievement Award were given during the banquet. Winners of the Outstanding Alumni Awards represent a wide variety of backgrounds and experiences.

W. Keith Kennedy M.S. ’41, Ph.D ’47, served as one of the most respected professors and administrators at the University, from 1949 when he joined the faculty as an agronomy professor, to his retirement in 1984 as provost and professor emeritus. He continues to serve the Ithaca community as vice-president of the Atlantic Philanthropic Service Company, Inc.

As the proprietor of Duelwood Farm in Schaghticke, New York, Raymond E. Johnson ’54, served as a leader in both local and national dairy associations. In addition, he was instrumental in recruiting Cornell students from his district.

Solomon Cook ’42, M.S. ’47, Ph.D ’50, the first Native American to receive a doctorate from Cornell, served as a role model and educator to youths on the St. Regis Akwesasne Mohawk Reservation in upstate New York. In addition to his roles as teacher and guidance counselor, Cook served as Chief of the tribal council, helping the community recover from periods of unrest, and as an active agricultural researcher and farmer.

During his 33 years with Farm Family Life and Mutual Insurance Company, Albert J. Beard, Jr. ’52 became well known to the farm community for his kindness and professionalism. An active community member, Beard served on the school board and was a member of the Milford Rotary Club. He also sat on the board of the ALS Alumni Association.

In addition to performing the duties of district administrator for Key Bank of New York, Douglas S. Brodie ’55 has worked tirelessly as a fundraiser for many organizations, including the ag college and LEAD NY, the Empire State Food and Agriculture Leadership Institute, of which he was director.

Paul F. “Rick” Zimmerman ’78 received the award for Young Alumni Achievement for his work advocating the concerns of rural residents and farmers in both Albany and Washington.

Grape Center Created

Cornell University and Pennsylvania State University have joined forces to create the Lake Erie Regional Center for Grape Research and Extension. Designed to make the New York, Pennsylvania and Ohio grape industry more competitive, the center will provide a single, central facility for research and industry extension programs, and develop a coordinated research program involving Cornell and Penn State faculty and on-site staff.

Dr. David L. Call, dean of the College of Agriculture and Life Science stated that in light of decreased public funding for grape research, “the formation of a multi-state research and extension center [would offer] greater efficiency and capacity in the development and delivery of new information and programs.”

Wing Named President at SUNY Cobleskill

Kenneth E. Wing ’58, Associate Dean for the College of Agriculture and Life Sciences was named the ninth president of SUNY Cobleskill.

During his tenure at Cornell, Wing was responsible for faculty and staff concerns, such as recruitment, development and planning. While at Cornell, Wing was deeply involved in many projects and committees, including Alumni Affairs, Intercollegiate activities and admissions. He chaired the United Way campaigns at the University of Maine, where he served as dean for five years, and at Cornell. Additionally, Wing served on the Board of Directors of Cornell Rural Schools Program since 1985, and has chaired the Cornell Plantations Advisory Board since 1988. For three years, Wing and his family lived in the Residence Halls as participants in the Faculty in Residence Program.

Professor Promotions

Dr. Reginald H. Walter has been promoted to full professor at Cornell’s Agricultural Experiment Station in Geneva, New York. Walter, a professor of food science in the Department of Food Science and Technology has been working on ways to improve food processing economics by using the waste products such as crushed apple and grape pulp.

Dr. David M. Soderlund, also of the Agricultural Experiment Station, has been promoted to full professor as well. A professor of insecticide toxicology in the Department of Entomology, Soderlund is internationally recognized in the field of insect toxicology, and often speaks at symposia. Most recently, he has been working on the application of molecular biology to the study of insecticide toxicology.

Ralph Hardy Appointed to Agricultural Research Board

Ralph Hardy, president of the Boyce Thompson Institute for Plant Research at Cornell University has been appointed to the board of directors of the new Federal Alternative Agricultural Research and Commercialization Center.

The nine-member board will oversee an organization which will promote new industrial uses for agricultural products. They will emphasize the use of non-traditional products that are not used for human or animal consumption. The organization will try to develop projects which will create more jobs, increase rural economic development and diversify agricultural material markets.
WHAT DOES IT MEAN WHEN YOU can eat McDonald's in Bangladesh, see Mickey Mouse in France, and watch the Marlboro Man ride his horse in Japan? It means that more and more businesses are finding markets abroad. Globalization has become the hot new "buzzword" in business, describing the increased trend toward international marketing. This buzzword has also found a place in the vocabulary and curriculum of the Department of Agricultural Economics in the College of Agriculture and Life Sciences. Giving outstanding students an opportunity to comprehend the magnitude of opening food industry markets in the world is the goal of the department's new Food Marketing Fellows Program.

"Support from alumni and other industry leaders has enabled the development of a program for outstanding ag college seniors interested in food industry. After an application process, we select 10 undergraduates to be designated Food Marketing Fellows. This title allows them to participate in activities which will increase their interest in and knowledge of the food industry and its international market," said agricultural economics department professor Edward McLaughlin.

An interesting curriculum has been planned for the Fellows which will connect their class work with what is happening in the "real world." All fellows must enroll in a one credit course entitled "Food Marketing Colloquium" for both semesters of their senior year. Guest speakers from international food-related companies will come to class to speak with the students. "The majority of the speakers I asked to participate for the 1992/93 year have already responded "yes," said McLaughlin. At the end of the course each Fellow will have to give a presentation on an area of study covered by one of the many speakers.

Fellows will also take field trips to various food companies and conventions. The 1992/93 group started their fellowship in May 1992 when they attended the Food Marketing Institute Annual Convention in Chicago. This convention is the largest educational food industry conference in the country. The Fellows were there with 35,000 leaders in the global food industry.

The most exciting field trip of the year will be the Fellows' visit to Europe during the January 1993 break. In Europe, industry leaders will share information with the students on trends in the European and global food markets. For example, in 1991, the Fellows met in Paris with the senior vice president of the Promedes Company to discuss strategy planning, international expansion, retail pricing, profitability, and the differences between the European and American food markets. After Paris, the Fellows went to Mulheim, Germany and met with the senior management of the Aldi Company to discuss aggressively expanding European markets.

The Aldi Company has a special relationship with the program. Aldi, in conjunction with the ag college, sponsors the Fellows so that they can afford to participate in the year's activities. Timothy Lebeau '77, president of the American division of the Aldi Company, worked with McLaughlin in creating the program. "I think it is important that students become aware of the increasing international nature of business," said Lebeau.

Lebeau and McLaughlin developed the program during the summer of 1991. "As a graduate of the college it was natural for me to have an interest in improving the agricultural economics department," said Lebeau.

To see if the program was feasible, McLaughlin picked a small number of students to be 1991 Fellows. McLaughlin and Lebeau thought the test run was so successful, they decided to select 10 fellows for 1992 after a formal application process. Seniors Amy Bushby, Daniel Hooker, Andrea Jeffers, James Leggiero, Kim Melchionda, Eric Peschke, Brad Schoenfield, John Schultz, Ann Wang and Julie Wojcik were selected to participate. "The department does consider it an honor to be selected to participate as a Fellow. It is not required to be an econ major but a strong major is highly motivated and has shown an interest in the food industry," said McLaughlin.

McLaughlin would like to see the program grow and encourages students to inquire about the program next year.

"The Food Marketing Fellows Program has enabled me to gain valuable experience and knowledge of the food industry outside the classroom," said Sandy Freiberg, 1991 fellow.

by A. McKiegan '93
About the Issue

This issue of the Countryman marks 90 years of reporting stories for and about the College of Agriculture and Life Sciences. The basics of some of these stories have been around since we began, but how they have changed! Who would have thought that our early stories about dogs would evolve into stories about pet dental care? This issue covers professors traveling and learning abroad, new ways businesses use statistics for profits, and the quest for new uses for natural substances. The winners of global warming are introduced and a new method of teaching is discussed. Meet one of today’s star athletes. Revisit the debate over animal use in science and the new debate over Columbus Day celebrations. Finally, swing into some sweet news about fruit.

On the cover:

New studies of grapes and other fruits may be cause for sweet celebration. For good news about grapes, read “The Grape News About Wine” on pages 20 and 21. For more sweet news, read “Honey Does an Apple Good” on page 22.

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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, sexual preference, age, or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.
"THERE'S ONLY ONE THING WORSE than bad breath and that's no breath at all," according to Dr. John E. Saidla, chief of dental services at Cornell University's College of Veterinary Medicine. Halitosis can be quite an offensive odor and usually a sign of bacterial invasion in and around pets' teeth.

This is just a taste of what students taking Small Animal Dentistry Laboratory learn. The lab experience gives them exposure to dentistry yet is not designed to teach proficiency, but rather the ability to handle and utilize instruments and become aware of variations in the mouths of small animals. Practically every dental procedure available to humans is provided for animals as well.

Saidla, often referred to as the "father of small animal dentistry," might modestly deny that label retooling. "No I'm not, I'm the father of three children!" His interest in academic medicine brought him to Cornell University in the fall of 1988. He is the author of Small Animal Dentistry. Saidla began as a base veterinarian in the air force at Hancock Field, Syracuse, New York. This is where he first got an introduction to human dentistry. Regarding pet dentistry he said, "I was real intrigued by it." He has since been in practice for 30 years. Now, over 300 dentistry cases a year pass through the small animal clinic at Cornell. "Students are my driving force and I like helping owners," Saidla said.

Students study hypothetical cases, such as this one involving the dog 'Jean's Queen.' Mrs. Williams (a breeder of cocker spaniels) is unhappy because Jean's litter had several puppies with genetically inherited crooked teeth and narrow jaws. Cases such as this one need careful ethical and genetic consideration by the veterinarian and owner. According to The American Kennel Club standards for dealing with genetic disease, it is unethical to correct malocclusions inherited in a particular breed. The animal would need to be neutered before any dental work would be performed. This ensures that the genetic trait is not passed on through breeding.

Whether a pooch prefers tuna, malt or liver an owner can easily learn to brush the pet's teeth. Avoid using spearmint, as it creates too much salivation. Specialized tooth brushes can be purchased and oral rinses are effective too.

Without literally venturing into an animal's mouth any of Saidla's students may work on the periodontal disease program he developed for the IBM. There is even another program of graphics and text which was developed for the Macintosh by Stephen D. Rutherford of the veterinary college. This program serves as a medical record of the animal. By interacting with the program the orthodontic problem can be identified. Students can record a history of each tooth on a computer-generated diagram of the mandible and maxilla. Moving from the upper to the lower jaw, users indicate any tooth and a history record folder is displayed. This allows the veterinarian to keep notes. The program's drawing tool can be used to specify the area on the tooth where erosion has occurred. The Macintosh program includes procedures, prevention and standardized nomenclature. The only thing the program doesn't do is beg for a hard biscuit when the examination is through.

by Lauren Oelkers '94
EVERY YEAR CORNELL STUDENTS GO abroad to study, work or play. They come back filled with stories of their adventures and a new outlook about the world. Perhaps what is less known is that many members of Cornell's faculty also work, teach or take sabbaticals each year and come back with new and enriching experiences. With this in hand, they incorporate what they have experienced into their classes and lectures, bringing a bit of the outside world into the Cornell campus. This past year, faculty of the College of Agriculture and Life Sciences have worked in different parts of Asia. Many have returned to share their work, research and experiences with the Cornell community.

One such person is Royal D. Colle PhD ’67, Chair of the Department of Communication. Colle's extensive work and experience abroad makes him a wealth of information concerning Asian countries. In his most recent trip in July 1992, he collaborated with educators at Nanyang Technological University in Singapore to help develop their School of Communication Studies. Colle spent two weeks at Nanyang Technological University making recommendations for the curriculum and proposing courses specifically relating to the needs of Singapore’s high technology communications society and its multi-cultural population. As a result of Colle’s work abroad, an educational exchange took place when Dr. Eddie Kuo, Dean of the School of Communication Studies at Nanyang Technological University came to the communication department in September 1992 to give a series of lectures in collaboration with the Department of Modern Languages and Linguistics and the Southeast Asia Program.

Colle's work emphasizes the need for planning and strategy in communication programs for developing countries. His interest in this field stretches back 23 years when he first went to India to help an agricultural university establish an academic, research and service program in the communication field. More recently, Colle has been working with Dr. J. Mayone Stycos, Director of the Population and Development Program in the Department of Rural Sociology, studying the knowledge and beliefs of India’s adolescents concerning family planning and AIDS. The study is measuring the current level of knowledge of adolescents on these topics and will include an intervention component designed to increase that awareness. The study has revealed so far that, "There is substantial room to increase awareness about family planning among high school students in India," said Colle. Colle will return to India in October 1992 to plan communication intervention activities.

Colle feels that his research and work abroad brings relevance to a course that he teaches at Cornell, Communication in the Developing Nations: The course deals with how communication relates to sectors in a developing nation's society such as health, nutrition, agriculture and family planning. Students in the course formulate their own communication strategy for one of these sectors. Colle draws from his work and research abroad and uses the countries he has worked in as case studies. Colle said his work in Asia, "Makes [him] feel all the stronger about how important communication is in development activities and at the same time somewhat frustrated." He commented that there are those who still do not believe communication planning and strategy are vital parts of development programs.

When asked how Colle’s experience abroad has affected the communication department he answered, “Well, I think it has convinced me that leaders in the field of communication need to understand communication beyond the Atlantic and Pacific borders of the United States.” He went on to say that anyone who wants to be in the forefront of advertising, public relations or business has to expand their knowledge beyond the confines of the U.S.

Another member of the Department of Communication who spent time in Asia is Associate Professor Daniel McDonald. McDonald took a sabbatical in Hong Kong for six months in the spring of 1992 at the Chinese University of Hong Kong. At Chinese University, McDonald lectured in the Journalism and Communication Program teaching a course in Research Methods and Mass Media and Society. He found his sabbatical a convenient way to further a study he had been conducting at Cornell. McDonald’s research involved the role of mood and emotion in daily life. His subjects were Hong Kong residents and he found that "In face of certain moods or emotions, people turn to media to change their mood." For example, McDonald said people would listen to music in order to
McDonald, who speaks no Cantonese, the dialect spoken in Hong Kong, found that even though his students spoke English there were still some problems teaching. "For one thing, I didn't have any examples," he said. McDonald stated that cultural differences between him and his students made it difficult for his students to relate to examples from the U.S. However, McDonald impressed his students with the Cantonese he did learn during a student presentation. The student was talking about a particularly difficult concept and explaining it to the other students in Cantonese. McDonald knew instinctively what the student was discussing and realized that the other students were having difficulty grasping the concept. He intervened in English over the troublesome area and when he finished a silence fell over the class. A student then leaned over and asked McDonald when he had learned Cantonese.

McDonald feels that though being in Hong Kong was not easy, "Going away helped me focus on the broader aspects of communication." As a result he said, "I'm teaching Intro to Mass Media a little differently, using different examples." McDonald has been teaching Introduction to Mass Media for the last seven years. He also said that, "I'm more sensitive to students coming from other countries." McDonald sympathized with the language problems associated with living in another part of the world.

One of McDonald's most memorable experiences came during a conference at Chinese University with educators from China. A group of them were having a discussion. "I'll never forget that retired man from China's face as we discussed freedom of the press ... his face was uncomprehending," said McDonald referring to the tight control the Chinese government keeps on the media. The retired man's face brought to mind a passage from an article written by Charles Cooley in the 1890s that stated that new communication technologies would alter the world, making democracy inevitable. McDonald hopes to return to Hong Kong to attend a conference next summer.

Professor Gene German PhD '77, in the Food Industry Management Program, is another member of the College with considerable ties to Asia. He spent August to December of 1991 in Japan. German's trip was sponsored by two Japanese retail companies, which he worked for during his time there. A former Cornell student in Japan helped set up the position for German. German also spent time studying the food distribution system in Japan. One of the main concerns of German's research involved how to distribute American products in Japan. Until last year, the Japanese government held tight restrictions on building large stores such as supermarkets. Approval of local and federal government was necessary and not forthcoming because the traditional food distribution system is made up of many small grocery stores rather than large supermarkets. These small groceries carry mainly locally produced products and very few foreign products. American companies have had difficulty getting into these Japanese markets. Due to pressure from the U.S. government however, Japan has agreed to continue to relax its laws over the next few years, making it possible for American companies to access Japanese markets.

German's work and research in Japan is incorporated in seminars at Cornell's annual Food Executive Program, of which he is one of the directors. He also applies his experience to classes such as Food Industry Management, Food Merchandising and Food Marketing Colloquium.

German stated that his most memorable moments in Japan came from the warm reception he has received from former Cornell students who have returned to Japan. One former student who is now a producer at a weekly business show made it possible for German to appear on Japanese TV in a segment comparing Japanese and U.S. food distribution.

German has no immediate plans to return to Asia, but he will continue to share his experiences and work in Asia with his students.

by Ann Chi Lau '93
Making Cents of Numbers

ACCORDING TO PETER FRANCESE MRP '68, reputable sources such as The New York Times frequently cite his magazine because it reports consumer trends one to two years before anyone else does. For example, articles in the October 1992 issue examine the spending patterns of little-discussed population segments like children and opinion leaders.

In case you were wondering, Francese is not the publisher of today's hottest fashion magazine or a financial forecaster on a winning streak. He is the publisher of American Demographics, a unique Ithaca-based magazine devoted to reporting "consumer trends for business leaders."

In addition to monthly issues of the magazine, American Demographics also publishes books on demographic topics, various catalogs of demographic products, a monthly newsletter and editors are frequently asked to speak around the country on emerging trends. When asked to describe the firm, Francese said, "We are publishers of consumer information products."

But what exactly is demography? Demography is the statistical study of changes in populations over time. According to Professor Thomas A. Hirschl of the Department of Rural Sociology in the College of Agriculture and Life Sciences, much of the demographer's time is spent identifying the impact of these changes on relevant institutions.

Using statistics gathered from data collectors like the United States Census Bureau, demographers go through a complex process of identifying and interpreting trends. Francese refers to this process as a "learned art."

The vast majority of consumer trends reported in American Demographics are discovered at American Demographics because of the company's narrow focus and experience. This enables American Demographics to publish information on these trends well before other sources.

American Demographics uses available data to identify consumer trends and analyze the impact businesses can expect these trends to have on the purchase behavior of their customers. This application of demographics to the private sector is unique because traditionally, demographic research is used in academic or government settings to assist in making policy decisions.

For example, Hirschl studies population changes in New York state for Cornell Cooperative Extension. By analyzing and identifying the changes in populations that affect the educational programs provided by Extension, Hirschl ensures that the services provided are in line with the needs of the population.

As a result of its unique focus, Ameri-

From left, Brad Edmondson '81, editor-in-chief of American Demographics, Peter Francese MRP '68, publisher of American Demographics and Barbara Bryant '47, director of the U.S. Census Bureau.
American Demographics currently has over 35,000 subscribers, a base of readers that continues to grow. Seventy-two percent of these subscribers hold positions in top and middle level corporate management. These leaders, according to Francese, read American Demographics to better understand the markets they serve. This enables them to improve the effectiveness of their company's strategic planning, marketing and advertising efforts.

Knowledge of the consumer is increasingly important to businesses in today's market. According to Francese, there are no mass markets anymore. Thirty years ago, it was possible to market soda to the general population since the soda market was still growing.

Today, however, the market for many general product categories is saturated. The demand for soda, in general, is no longer growing. As a result, companies can no longer appeal to the mass market and continue to grow. Instead, companies target their advertisements to specific consumer segments in order to capture additional market share from competitors. Similar products may, thus, be marketed in very different ways. For example, Pepsi Cola advertising is aimed at young consumers. Its slogan is "The choice of a new generation." Schweppes ginger ale, on the other hand, is targeted to a more sophisticated market segment. Its advertisements stress the product's taste, which is not as sweet as most other sodas.

As a result, up-to-date information on who consumes specific products has become increasingly important. American Demographics serves as a "targeting tool" used to "enlighten marketing people about their customers."

American Demographics' circulation base also includes demography teachers, like Hirschl who use American Demographics as a teaching tool to illustrate "real-world" applications of demography.

From its beginning, American Demographics has had a loyal following of approximately 150 journalistic leaders attracted by the "scoops" it offers.

American Demographics' well-established position among business leaders as "The Source" of information on consumer markets seems secure.

American Demographics' reputation among scholarly demographers also appears secure. Hirschl reads American Demographics because it has a lot of useful information that is applicable to his own research for Extension. According to Hirschl, the work American Demographics does is solid as is the analysis of data used to support the trends.

At its core, the research American Demographics does is not that different from the work people like Hirschl do. Each merely addresses different interests. "If students are interested in sociology," said Hirschl, "they go to the sociology department. Students interested in business go to the business department."

When he founded American Demographics in 1978, Francese estimated that the circulation of American Demographics would reach a maximum of 25,000 subscriptions. Circulation has already surpassed this estimate. With future plans to expand by publishing additional catalog items and possibly spinning off industry-specific magazines the company's future looks bright.

by Jacqueline K. Lurie '93

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Did You Know?

According to the Times Mirror Center for the People and the Press, in November 1991, only 48 percent of all Americans believed that the government was "run for the benefit of the people."

In 1990, the average working woman's salary was 71 percent of the average man's in the U.S., according to the U.S. Census Bureau.

Sixty-one percent of America believes American cars are "in."*

Men Who Give Flowers to Women (by age)†

<table>
<thead>
<tr>
<th>Age</th>
<th>18–30</th>
<th>31–44</th>
<th>45 &amp; up</th>
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<tr>
<td>%</td>
<td>83%</td>
<td>75%</td>
<td>59%</td>
</tr>
</tbody>
</table>

According to the Metropolitan Life Insurance Company, in 1990, Japan had the highest life expectancy of 15 industrialized nations. The United States ranked eleventh.

1. Japan   78.9 years
11. United States 75.4 years

In 1991, the average American spent 39 hours each week on leisure activities, two hours more per week than in 1989.*

According to the 1991 American Kitchen Life Survey, the kitchen is used more for household conversation than for eating.

Male Use of Hair Care Products, according to Mediemark Research, Inc.

<table>
<thead>
<tr>
<th>Products</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shampoo</td>
<td>92%</td>
</tr>
<tr>
<td>Hair spray</td>
<td>30%</td>
</tr>
<tr>
<td>Hair color</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Source: The Roper Organization
†Source: Gallup Organization

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*Source: The Roper Organization
†Source: Gallup Organization
Searching for Chemical Treasures

“CHEMICAL INTERACTION IS THE OLDEST type of biological interaction,” said Thomas Eisner, professor of neurobiology and behavior at Cornell. “Chemical interactions happened before there was interaction through sound or smell or anything.”

Nature had millions of years to develop chemical signals, he explained, and we should turn to nature to learn about chemicals that might be used to our benefit.

Exploring the compounds which are responsible for such basic phenomena as finding food, finding mates or repelling predators is at the heart of the discipline called chemical ecology and is the idea behind the organization founded in summer 1992 by Eisner, chemist Jerold Meinwald, Jon Clardy, professor and chair of the Department of Chemistry and Wendell Roelofs, professor of insect biochemistry and chair of entomology at the N.Y.S. Agricultural Experiment Station at Geneva.

The Cornell Institute for Research in Chemical Ecology, or CIRCE, is committed to exploring chemical interactions between all types of organisms, to protecting biological diversity and promoting conservation, and to finding new solutions to problems in medicine, agriculture and environmental science.

The founding scientists have several modes of action to accomplish these goals. The organization plans to offer a number of courses, including a field course in chemical ecology not only for Cornell students, but for students from all over the world. The field course will be taught at the Archbold Biological Station in central Florida. Cornell has a working relationship with this 15,000 acre preserve and some chemical research conducted by Cornell scientists is currently underway at the Archbold Station.

In addition, CIRCE hopes to establish two endowed professorships at Cornell. An important aspect of CIRCE’s ambitions is to ensure continuity of chemical ecology as a field. No one promises that chemical ecology will continue to exist when the members of CIRCE retire, “which in my case is the year 3020,” said Eisner. But by sharing their knowledge and love for their work, and by establishing CIRCE, Eisner, Meinwald, Clardy and Roelofs are laying the foundation for a successful future of a division of biological sciences.

In order to establish any programs, however, CIRCE must raise money. They need funding to establish training programs and field courses, and money to endow professorships. “We would like to find individuals or foundations or businesses that would be interested in supporting us,” said Clardy. “I could see an industrial foundation giving us money to set up the field course at the Archbold Station. Funds for an endowed professorship have to come from an individual.” This year, an anonymous donor will match funds donated to endow professorships, giving donors an opportunity to endow a professorship for considerably less than usual.

CIRCE also seeks to promote conservation by helping establish cooperative projects involving developing nations, Cornell and industry. The first collaboration was set up between a major pharmaceutical company and a small country with a great deal of biodiversity to offer.

The collaboration between Merck & Co., Inc. and Costa Rica’s Institute of Biodiversity (INBio) was an amazing accomplishment, and the men who would later form CIRCE played a role in the negotiations.

In September of 1991, Merck and INBio signed an agreement. Merck pledged $1 million over two years to help fund a search for chemicals of potential pharmaceutical use in Costa Rica’s rainforest.

INBio, a non-profit organization, employs non-scientists to go into the forest and collect biological samples. INBio then sorts and catalogs the species, most of which are wholly unknown, and extracts chemicals from them for studies of compounds that could be developed into marketable products, such as drugs or insecticides. In return for Merck’s $1 million donation, INBio sends promising samples to Merck’s laboratories in the United States for further analysis.

Perhaps the most important aspect of this collaboration will come later. Scientists at Merck will work to develop compounds from INBio into marketable products. The profits from any resulting products will be shared with Costa Rica to help fund conservation efforts.

Nothing has been developed through this merger yet. “The first samples are just now going to Merck. Finding a drug is a long term proposition,” said Clardy. Fifteen to 20 years is not an unusual time period in which to develop a drug.

“The investment needed to develop a single new drug is incredibly large,” said Meinwald. “A good estimate might be $250 million,” added Clardy. “You can’t do this inexpensively or quickly,” concluded Meinwald.

One successful pharmaceutical product, however, can bring in an incredible amount of income. If such a find comes out of the Merck and INBio agreement, it could have a profound and wonderful impact on the tiny country, whose budget roughly equals that of Cornell, according to Eisner.

Even the experts can’t guess what, if anything, might come out of the Costa Rican rainforest. “It’s like buying lottery tickets,” Clardy said. “A major drug could bring in a billion dollars a year, but there are very few major drugs.” So far.

Eisner made an important point on this note. Samples do not become useless once INBio and Merck evaluate them. “Ten years from now, there will be new
A female sex pheromone sample attracts a male moth which flashes its sex organs.

Methods and science will be able to find compounds that we can’t find now. There is no obsolescence here.

No one guarantees that INBio and Merck will find anything useful. “You might look for a hundred years and find nothing really useful,” said Meinwald, “or you could find something in the first few weeks. You’d learn a lot of science in the hundred years, in any case.”

The founders of CIRCE would like, and expect to see, other collaborations worldwide like that between INBio and Merck. Representatives from INBio are traveling to various countries to talk about forming institutions like theirs. INBio is essentially independent of the government, but is charged with preserving the biodiversity of the country.

“Conservation of biodiversity is not just putting a fence around pristine land,” said Eisner, “but also exploring the chemical and biological diversity of the land.”

Many scientists believe that the majority of the world’s species live in the tropical rainforests. However, science does not know how many species exist on earth, even to the nearest magnitude. In fact, most species on earth today are unknown to science, and remain to be identified.

“I could go to Brazil and collect samples for two days,” said Eisner, “and come back with 20 new species.”

Rainforests and other natural habitats are being destroyed even as you read this, and along with those habitats, entire species are dying. An insect with the clue that could lead to a cure for AIDS may have just become extinct.

It’s vital that science learn about and explore unknown species for compounds that may help us, not only in medicine, but in many fields.

For example, the fourth founding member, Roelofs, is an expert in insect chemical communication systems. He sees an important role for CIRCE in the development of unique bioassays to screen for natural compounds, other than insecticides, useful in insect control.

For example, Roelofs explained, a bioassay could be developed to look for a chemical that could prevent female insects from producing the pheromones that attract males, thus preventing the insects from mating.

Roelofs feels that CIRCE should help develop these types of tests, such as those that could be used for biological pest control, and train ecologists in other countries to use them to look for unknown biological activities.

The ideas behind CIRCE are not all new. In fact, Eisner and Meinwald have been collaborating on work in chemical ecology since 1960. What is new and vital is the idea of institutionalizing this type of work and carrying their knowledge and expertise deep into the rain forests and other unexplored habitats on earth. CIRCE has opened the door to a fascinating and promising field. Chemical ecology promises to bloom in the future like so many orchids in the rain forests today.

by Lesley J. Wright '93
Global Warming: Winners and Losers

IF OUR GLOBAL CLIMATE WARMS IT will produce major consequences that will affect agriculture for centuries to come. Is it possible to adequately plan for centuries of bad weather? This premise founded a major new study conducted by researchers in the College of Agriculture and Life Sciences. They studied the potential impact of global environmental change on agriculture.

What happens to agriculture if the earth’s climate gets warmer? Although many indicators give evidence that global warming exists, no one can predict the future climate with certainty, and no one knows this better than farmers. A year of bad weather can mean a bad year for crop yield, but with planning and forethought farmers can sometimes avoid a total disaster.

Professor Duane Chapman focuses his research on the causes of climate change, and how to deal with them. He said that it is a matter of “dealing with declining income versus improved environment,” since humans produce many of the effects of global warming, and to repair the damage could have major economic impacts.

“Climate change is gradual,” said Assistant Professor Harry Kaiser, who studies the agricultural impacts of global warming for this study, “Each generation will not notice it. Some regions will adapt better than others. The cooler north will experience benefits, while the south will suffer losses.”

The gradual pace of the change in human terms is an important factor, since plants need time to adapt. As a particular cultivar’s yield decreases, scientists can engineer new varieties, and also transplant heat-adapted varieties further north. Agricultural scientists have done this over the last 100 years. “Although,” said Kaiser, “there is obviously an absolute upper limit for engineered plants.”

“It is important to note that the pace may be gradual in human terms, but not in planetary terms,” said Jon Erickson ’91, “This is perhaps the most rapid one-direction change in the history of the planet. We are taking carbon that took millions of years to fix and are releasing it into the atmosphere over a few centuries.”

The scientists also explore the possibility that global warming may actually provide possible benefits. According to Kaiser, the agricultural sector will change crops, cultigens and practices. However, there will be gainers and losers; it simply depends on the magnitude of the changes.

Northern farms might benefit, while southern farms may already be marginal producers now. The northern lake states have adequate water, and with a longer growing season could grow longer-maturing, higher yielding varieties. Better soils exist to the north, and the corn belt could move north as the climate warmed.

In the north double cropping becomes possible due to a longer growing season. However, southern farmers are already double-cropping, and southern farms are already experiencing water stress. Hotter and drier weather is bad news for farmers, and the analogy is global: The northern areas are gainers and the southern areas are losers with global warming.

Southern crop adaptation depends on the severity of the warming and on the
availability of water. The climate models used in this study cannot predict the precipitation in any particular region. These models, interpreted for this study by Assistant Professor Dan Wilks, are called general circulation models. Even by utilizing the most advanced supercomputers, the models do not agree on the predicted amount of global precipitation. Some models show more, some less precipitation. The problem is that the general circulation models lack the ability to accurately model the oceans and clouds, and that is why a precipitation model is lacking.

Kaiser said that, "General circulation models need more hardware to be accurate; perhaps in five to ten years we will see great improvement." For the present, however, the consensus is that global precipitation and temperature will rise, but there is no consensus on regional precipitation, and availability of water is a critical factor in agriculture.

The study also analyzes claims of an additional benefit from a carbon dioxide induced global warming. This is called the carbon dioxide fertilizer effect.

Plant scientists have known for over 100 years that increased carbon dioxide in a greenhouse produces increased yields under controlled conditions. Extrapolations from these greenhouse carbon dioxide tests indicate that increased global crop yields are possible.

Carbon dioxide plays two roles—one to enhance plant growth and the other, along with other greenhouse gases (GHGs), to contribute to global warming.

The combustion of fossil fuels produces most of the GHGs, of which carbon dioxide is the most common. Therein lies the problem. Erickson points out: "The carbon dioxide fertilizer effect is not just carbon dioxide: other harmful gases come along with the package, such as tropospheric (ground level) sulphur oxides and ozone."

Erickson further states that, "Claims about the carbon dioxide fertilizer effect must be viewed in an ecological framework." He said that, "Relying on carbon dioxide from industrialization to fertilize the world's agriculture is analogous to relying on your car's exhaust to fertilize your home garden." In addition, Erickson said that water and nutrient availability limit the benefits of the carbon dioxide fertilizer effect, and any remaining benefits are offset by climate changes, enhanced ultra-violet radiation from ozone depletion and additional harmful GHGs.

What does all this mean? "The answers are speculative at best," said Kaiser. "The question is should we devote a huge amount of our resources to prevent global warming?"

The answer to that question might surprise us. Since scientists believe that carbon dioxide and other GHGs are the cause of global warming, we might reduce these gases in an economically sensible way.

What is our best strategy for reducing carbon dioxide emissions? Chapman said, "It is boring. We already know what to do: Energy conservation."
Imagine taking a course in Kennedy Hall while your professor is lecturing via satellite from Ohio. If you had a question, you could either call a toll-free number, and have it answered during class time, or fax the question before class begins so the professor could prepare a response.

That is exactly what 60 graduate students and faculty members experienced last spring when they took “Teaching Methods,” taught by Professor L.H. Newcomb of Ohio State University at Columbus. This interactive course was offered through the Agricultural Satellite Corporation, commonly known as AgSat. The satellite network joins together 38 land grant universities across the country, and distributes and shares academic instruction, cooperative extension programming and agricultural research information. Cornell is one of the charter institutions in this corporation, and is currently experimenting with this exciting new form of telecommunications.

AgSat originated in 1989 at the University of Nebraska at Lincoln with funding from both the United States Department of Agriculture and the Department of Commerce. Cornell has had the capability to receive courses and seminars through a satellite downlink since AgSat first began. Currently, they are installing a satellite uplink which will enable Cornell to produce courses and seminars that can be transmitted over AgSat to places throughout the world, such as Honduras and Uganda, where Cornell has ties with agricultural institutions.

Dean David Call ’54 of the College of Agriculture and Life Sciences described Cornell’s use of AgSat as being threefold. As a member of AgSat’s Board of Directors, Call has defined the services to be academic programs, cooperative extension programs and shared research programs on an international level.

Professor George Conneman ’52, Associate Dean for Academic Programs in the College of Agriculture and Life Sciences, feels that AgSat will result in an enhancement of the academic programming Cornell already has. “With AgSat, there’s a potential to offer a course that we do not currently offer.” Conneman added that AgSat would be used primarily as a supplement to courses already taught at Cornell.

Professor Dean Sutphin, chair of the Department of Education, was one of the two local coordinators for last spring’s “Teaching Methods” course. He said that graduate students had the option of taking the course for one, two or three credits. The variable credit hours allowed Sutphin and Professor William Drake to administer sessions where students had the opportunity to practice teaching in a small classroom format which Sutphin called “micro-teaching.”

Cornell had 60 people taking the course, which had a total enrollment of 180 people throughout 11 universities. During the two-hour lecture, Newcomb opened the floor for questions which were asked by phone or fax. Students could call that same number during a set time each week, which were compara-
of the course asked Albright to supplement the lectures with his first-hand knowledge of the subject matter. The first two lectures which Albright delivered were taped and sent to the schools because Cornell did not have its uplink capabilities installed yet. Albright's later lectures will be sent live over the satellite.

Some AgSat courses have been taped, so individual segments can be shown to classes in the future. The tapes of “Teaching Methods” were put on reserve at Mann Library so participants could see sessions they had missed.

Cornell professors have already had an opportunity to review courses shown over AgSat. Professor Dale Grossman reviewed an agricultural law course last year which was taught by Professor Neil Harl of Iowa State University, whom she feels is the foremost expert on the topic. Grossman felt that the course covered material already taught in Cornell courses, but stressed that AgSat will be beneficial to the Cornell curriculum by providing courses in highly specialized fields taught by experts across the country.

AgSat is also being used by Cornell for extension purposes as well as academic enhancement. Jane McGonigal '80, PhD '84, is Cornell Cooperative Extension's Assistant Director for Staff Development and Recruitment and has particular interest in its use of AgSat. Cooperative Extension's mission is to spread and foster the application of research-generated knowledge and leadership techniques to individuals, families and communities. Cornell Cooperative Extension reaches more than 7,300,000 individuals each year.

"Cornell Cooperative Extension has two interests in AgSat," said McGonigal. "The first is making programs available to as large a number of people as possible across New York state. The second is providing in-service education for Cooperative Extension agents and area specialists." AgSat essentially brings New York state closer together, united by satellite.

McGonigal offered an example of this program unification. A maple syrup production seminar was previously led by one person who traveled to 10-12 sites across the state. Now, the course can be taught once and transmitted simultaneously to all of these locations.

David Dik, Assistant Director of Media Services, said that about four county extension offices currently have the downlink ability to receive AgSat transmissions. The other extension offices have had to locate other local sites to hook up to the network. Dik hopes that 15-20 county offices will soon be able to obtain their own equipment. Media Services director David Watkins said that four major video conferences have been planned through Media Services.

"AgSat, because of Cornell's investment, at least gets programming here," said McGonigal. "Things that have a longer life will be put on tape for repeated transmission."

McGonigal said that through Dean Call's involvement, "We are more able to develop a state-wide network to use for both program and in-service education. I hope that in the long run, faculty involvement in seminars and presentations will help to move us ahead."

The financial aspects of AgSat have not yet been fully explored. "AgSat provides the vehicle to send out courses and seminars, but the cost of production is not covered," said McGonigal. Cornell had to pay a $10,000 initiation fee to join the network, and now pays a $5000 annual fee. "To gain access to a course over AgSat, an institution has to pay $500," said Dean Call. Call said that the fee is low in order to attract as many institutions as possible.

Additional funding has come from a cost-sharing program with the Department of Commerce, and Call is looking into gaining industrial partners to provide more support. Eventually, Call hopes a system will be established where institutions will pay per student, per credit, to the school providing the course.

by Jennifer Rabin '94
On the Fast Track

IT WAS ON A MILD, LATE NOVEMBER day in Tucson, Arizona that Pam Hunt '94 became one of the elite NCAA Division I distance runners. Before the race, Hunt, then a sophomore, got "more than butterflies." Pre-race jitters were commonplace for the 5'2" carrot-top from Bloomsburg, Pa., but this was no ordinary race. It was for the NCAA cross country championship. This was an event in which Cornell, fielding its best cross country squad in history, would set a precedent, creating a standard for future success.

"It was a very hard race," she recalled. "It seemed that you just had to sprint all the way." Pam did just that, placing sixth and leading the Big Red to its school-record shattering fourth place team finish. By virtue of her standing, Hunt received All-American status. But that late fall day was symbolic in more ways than one. Sure it represented the emergence of both Pam Hunt and Cornell University as true national cross country powers, but there was something deeper. It is perhaps best symbolized by the name of the championship meet's site: The El Conquistador Country Club. Like the merciless 16th century Spanish conquerors of the Americas, Pam has vigorously waged war on Cornell record books.

As a freshman, she was seventh at the cross country Heptagonals (a league composed of Army, Navy, and the Ivy League), and first in the 5,000 meter indoor and outdoor Heptagonals. Pam holds the Cornell frosh indoor and outdoor records in the 5,000 meters and the outdoor mark in the 3,000 meters. In addition, she represented the United States at the World Junior Cross Country Championships in Antwerp, Belgium. As the third American finisher Hunt placed 23rd in a field of 124 runners. Finally, she was named All-American by virtue of her seventh place finish in the 5,000 at the NCAA Championships.

Teammate and captain Loren Mooney '93 recalled Pam's emergence as a freshman, "She came in very powerfully, becoming the best on the team in her events by the spring track season. It became evident that she had the potential to do amazing things. In the last two years, she's gone from being one of the best in the Ivy League to one of the best in the country."

Last year, Pam captured the Heps cross country crown as well as its indoor and outdoor 5,000 meter titles. This past March, Hunt was the top American finisher in the World Junior Cross Country Championships in Boston, placing 15th in a field of 104. The reasons for the 19-year-old Hunt's success are evident to her coach.

"In loving to compete," cross country and track coach Lou Duesing said, "she trains harder." That training consists, on average, of 50 miles of running per week. Furthermore, the coach explained, it's her consistency that makes her great.

"Look at Carl Lewis," Duesing said, "in his races, he finds another gear. But most important, he does not decelerate. Similarly, Pam runs hard from the very beginning and holds her gear longer than opponents. She's also smarter than most.
of the people she runs against."

It is that intelligence which brings to the forefront Hunt's greatest challenge: balancing academics and athletics. "The Greco-Roman ideal was sound mind and sound body," Duesing commented. "But now, it's sound mind or sound body—take your pick. With Pam, that's definitely not the case."

Hunt is majoring in Wildlife Conservation in the College of Agriculture and Life Sciences. Last fall, to her surprise, she earned Academic All-Ivy honors, exceeding the 3.0 grade point and contributing athletic team member requirements. "I didn't know until it came out in the newspaper," she chuckled.

Despite her success in the classroom, it is her field work that is most intriguing. This past summer, for instance, she assisted a North Carolina marine biologist in repopulating a scallop community which was decimated by toxic algae. The previous summer, Pam worked at a Cornell USDA lab collecting bugs to test with natural pesticides.

On campus, Pam hopes to work on endangered species with the Cornell Greens. "The biggest problem with endangered species," she said with her facial expression changing to one of concern, "is habitat loss. The rainforest is an example... There's no place for those animals to live."

With all the time spent on athletics, academics, and related interests, humor is not lost on Pam or her teammates. In fact, teammates make light of Pam's pre-race frivolity.

"She gets a little preoccupied with the race at hand," Mooney recalled. "I find that if we just laugh at her enough she'll relax. She's definitely entertaining." Pam, Mooney added, is very superstitious before a big event. "Pam gets new socks from her dad before big races. She has to get the right socks," Mooney continued.

At age eight, when the right socks didn't matter, Pam's parents entered her in races and signed her up for soccer. She enjoyed the running, spurring her to try out for the high school cross country team. After suffering a stress fracture, Pam didn't draw the recruiting crush you'd expect of a future college All-American.

"What frequently happens," Duesing explained, "is that those who are most gifted by the accepted gauges of state championships, fast track times, and trips to the Kinney Nationals, are recruited. Those are qualifications Pam didn't have."

However, after her junior year, Hunt was interested in attending Miami of Ohio, the University of Pittsburgh, and Cornell University. That summer, she came to Ithaca for the week long Big Red track camp. After falling in love with Cornell's rolling hills, she caught the eye of assistant coach Mark Bilyk.

"Mark did an excellent job in seeing a talent in her that perhaps no one else saw," Duesing, who, like Hunt, came to Cornell in the summer of 1990, said.

Duesing feels fortunate that Pam came to Cornell without first knowing the identity of her head coach.

"Too often, in college, many people run solely for the scholarship," Duesing concluded. "Ideally, academics come first and sport is extra-curricular. Many athletes lose sight of that fact. Those things aren't the case with Pam. I think that there has been some serendipity for me in having Pam choose to come here."

With two years down and two to go, one thing is certain. If Pam Hunt's selection of Cornell was an "accident" then the Cornell Department of Athletics and the ag college are hoping for many more like it in years to come.

by Dan Masonson '94
The Debate Over Animal

IN TODAY'S SOCIETY, A CONTENTIOUS debate focuses on the ethical question of whether or not scientists should utilize animals in their research. The advances that researchers make in science and technology border on the miraculous. However, one must consider the numerous ethical questions that accompany these new innovations.

This highly disputed issue creates very strong opinions in the people who favor the use of animals in research and those who do not. People on either side of the issue can hold both extreme and moderate views. Even when people agree in principle, they often differ on specific issues. However, it is crucial for the people concerned to engage in rational debate. Only in this way can one resolve the ethical issues involved.

Dr. A. van Tienhoven, who teaches the senior seminar Ethics in Animal Science in the College of Agriculture and Life Sciences stated, "In order to dispute these issues, one needs to establish a common ground, have respect for each other, and to respect the law." This allows people with widely divergent opinions to still argue rationally. If extremists on either side refuse to accept the law as one basis for a common ground, then any kind of debate becomes very difficult.

Scientists often adhere to principles of animal welfare in their treatment of research animals. This view basically states that humans have a right to use animals, but they must not let the animals suffer. In addition, humans must provide for the needs of the animals under their care.

Dr. H.F. Hintz, Chair of the Department of Animal Science in the College of Agriculture and Life Sciences stated, "We have the right to use animals, but not to abuse them."

Scientists actually benefit directly if they provide optimal care for an animal. If a scientist uses a healthy animal in research, fewer variables affect the results of the experiment than if the animal were diseased. In addition, researchers can produce more reliable data if all the animals in a group experiment function at their optimum level.

In addition, federal and state legislation require that scientists follow certain procedures when they use animals in research. These rules cover many aspects of experimentation, which range from the animals' living arrangements to the number and kind of tests that a scientist can perform on an animal. The individuals who create these regulations face quite a formidable task. For this reason, Van Tienhoven stated, "We need well informed, well intentioned individuals to make these regulations."

Even with adequate legislation, people often disagree over what constitutes cruelty to an animal. The basic question of whether an animal in a given situation feels pain or not can be quite a subjective judgement. Sometimes animals exhibit no overt sign that they feel discomfort, even when they are clearly in painful situations. Traditionally, scientists used the animal's "level of production" to determine if it was under stress or felt discomfort. The level of production considers variables such as weight gain, reproductive rate and overall growth. Some scientists believe that one should not depend solely on the level of production to measure an animal's health. Hintz stated, "A fall in production should not be the only indication that an animal is in pain. One should do behavioral tests as well, for verification."

Critics of animal use in science often suggest that people utilize other methods to teach or do research; these include computer simulations, plastic models, cadavers and epidemiological data. Hintz stated, "I approve of the use of other methods whenever it is possible to get the truth." In addition, people opposed to the use of animals in research often claim that scientists perform an excessive number of tests on animals.

Is It Wrong to Use
Use in Science

Scientists frequently respond that, in some cases a study requires a large number of tests to obtain statistically significant data.

Many of the people who object to scientific experiments that use animals consider themselves animal rights advocates. Their beliefs vary in the extent to which they believe that animals possess individual rights. Their views range from those who see having household pets as an unacceptable subordination of another species, to those who wish to change or eliminate the current practices in the meat industry. Some of these people are quite rational in their arguments and actions, while others engage in radical behavior.

Animal rights advocates often criticize scientific research as “speciesist” since researchers imply that humans are superior to other animal species when they use an animal in research. However, many scientists view speciesism as inherent to the predator and prey relationship in nature. Van Tienhoven sees it as, “an inevitable consequence of civilization.”

Speciesism even exists in the legislation used to protect animals in research. Originally, legislation over the use of animals focused on the animals that people identified with: monkeys, cats, dogs and rabbits. Only recently did legislators expand these regulations to include mice, rats and other species that people could not identify with so easily.

One common criticism of the animal rights movement focuses on the radical elements within it that carry out some quite extreme actions. The animal rights movement has undoubtedly exposed numerous cases of mistreatment of animals. However, in some cases they also did tremendous damage to scientific research. Radicals even went to the extreme of threatening people’s lives. Although such actions may draw attention to an issue, ethically it is highly questionable behavior. Van Tienhoven quickly pointed out that “such threats are an unacceptable divergence from the law,” and if that kind of behavior were tolerated, it would ultimately lead to anarchy.

Critics of the animal rights movement also state that it is too dependent on emotional appeal. If one argues emotionally, through inflammatory language, or by depending upon graphic photographs as the basis for an argument, one cannot reach a rational or objective decision on an issue. Van Tienhoven stated, “There would probably be more sympathy for the animal rights movement if they used more rational tactics.”

These debates over the ethical treatment and use of animals are clearly complex. In addition, the public’s perception of techniques or practices in scientific research often differs dramatically from those of the scientists who use animals in research. Hintz cited the “need for an informed public.” He favors the idea that scientists establish such organizations as The American Society of Animal Scientists. These organizations help to explain some of these issues to the public.

Given the intensity of emotion over the use of animals in scientific research, it seems remarkable that people really only began to debate these issues over the last fifteen years. Van Tienhoven stated, “In the past, scientists did not really consider the issue, it was not deliberate or cruel, but people just basically did not give it much thought.”

The debates over the use of animals in research will surely continue as science progresses. The ethical questions of the degree to which humans can use animals are not easy to answer. One should confront and respect different views on these issues in the attempt to create a sound ethical judgement.

by Daniel W. Simon ’93

These Animals?
RON LAFRANCE SAID IT BEST WHEN he remarked, “The Quincentenary is like the Superbowl: there has to be a winner and a loser.” From the looks of it, the Europeans are under the impression that they have come out on top. After all, if it weren’t for Columbus, civilization, as some would have us think, would not have been introduced to the New World. There would have been no new land to exploit, and no new peoples to conquer.

LaFrance, a Mohawk Indian and director of the American Indian Program at Cornell, doesn’t see what all the hoopla is about, but he isn’t about to join the mass of Columbus bashers. “All it does is make people mad. When you’re mad, you don’t talk, you don’t resolve deeper issues that need dialogue,” he said. LaFrance hastened to add, however, that this statement should not be misinterpreted as amnesia on his part. He may not have a chip on his shoulder, but that doesn’t mean he is going to forget the past, a past that is quite difficult to forget. “There are some things we have suffered, but are we going to drag this baggage around?”

Though Ruth Ramos, a nutrition major of Chickasaw and Mexican descent, said she doesn’t think anyone should be celebrating the Quincentenary, she isn’t bitter about it. “I can’t think of anybody who is bitter about it [the Quincentenary]. To be bitter and angry doesn’t get you anywhere. It’s just too late to be rehashing things. The problems that we have, we should tackle them now.”

Ramos went on to add that what most irritates her is the perpetuation of the myth that Columbus was a great hero. “There are very educated people that are determined to keep this myth alive. And it really bothers me. It’s one thing for your average person to be mixed up, it’s another thing when very educated people, people in the know, are determined to conceal truths or perpetuate lies.”

When asked if the responsibility of enlightening those that are unaware of the facts lies in the hands of American Indians, Ramos replied, “I think it’s a little bit of both. We owe it more so to our own people to know how things really are. And I think we need to keep bringing up the subject so that it will get straightened out in the history books.”

Even today, 500 years since Columbus stumbled onto America, children are learning from history books that Columbus indeed “discovered” America (why?, was it lost?). If we are to accept this as fact, do we then also deny the truth that there were people inhabiting the region before Columbus’s arrival? We must keep in mind that there is more than one side to this story.

In an article written for the Northeast Indian Quarterly, now known as the Auke-Akon Press, John Mohawk argued that, “The obvious fiction of a ‘discovery’ of lands occupied by millions of people for tens of thousands of years underscores the ethnocentrism evident in most historical accounts.”

Very rarely, if ever, does one read an account of the number of American Indians that died as a result of Columbus’s said “discovery.” Ask a child what he/she learned about Columbus in school and
he/she may very well echo what Ramos remembers learning about the explorer: "He discovered America, a pioneer, and we owe a great deal to him."

In an article written for the Northeast Indian Quarterly, Robert Venables, a professor in the Department of Rural Sociology, writes that: "In the Western Hemisphere in 1492, there were an estimated 72 million to 112 million American Indians. In 1980 the count was approximately 28 million, 264 thousand. The large percent of deaths was due to disease introduced by Columbus and his crew and the other Europeans that subsequently followed.

The cruel treatment suffered by American Indians at the hands of Europeans was a result of the widely held belief, among Europeans, that they were superior to anyone else. It is a belief that is perpetuated still.

But perhaps something positive can develop out of this celebration. The Quincentenary is the perfect opportunity to increase people's awareness.

Karen Medville, a Cherokee Indian and environmental toxicologist in the vet college, certainly thinks so. If there's anything positive that can come out of this celebration, she said, it is educating others about Native Americans and the role they played in the colonizing of America by Europeans. Medville added that she would like to see people, "Have more respect. That's kind of my key thing. Have more respect for Native People's wisdom. They haven't been listened to, not only on what their concerns are, but how to solve problems and issues."

Ramos, as well, believes educating others could be a definite plus. She also stated that she hoped, "The people that are celebrating the Columbus Quincentenary should not be too enthusiastic and should not forget the repercussions of Columbus's arrival to America."

LaFrance certainly believes, or rather he hopes, that there will be some steps taken to increase awareness and understanding. But after the celebration, when we look back at the "marriage" between Columbus's statue in Barcelona and our very own statue of liberty, after we've been blinded by fireworks, after we've sat through not one, but two movies about the great pioneer's "discovery", is it likely that anything will change? Or will it be, as Ron LaFrance said, "Business as usual"?

by Dacia M. Morris '94

The oldest Christopher Columbus woodcut, published in 1577.
IT SEEMS AS IF EVERY DAY A NEW medical study steals another one of life's pleasures from the American dining experience. Long gone are bacon and eggs for breakfast and cheeseburgers and fries for lunch. The public has been sentenced to lowering its cholesterol and saturated fats via rabbit food and water. Whatever happened to just laying off cigarettes and booze? Will all of life's pleasures fall victim to science?

Maybe not. Thanks in part to its high resveratrol content, red wine is fighting back. Resveratrol is a natural pesticide produced by plants to ward off disease. It has also been shown to reduce the risk of heart disease in laboratory rats.

Dr. Leroy Creasy BS '60 MS '61 of the Department of Fruit and Vegetable Science discovered resveratrol in wine last year. According to Creasy, resveratrol has been known for 50 to 60 years, and was discovered in grape leaves in the mid-70s. Creasy, however, is the first to discover the chemical in grape berries and their products. He started searching for resveratrol in grape berries five years ago, because he was concerned that the development of more disease-resistant plants by vineyards might lead to toxic levels of the chemical in the berries and their products.

While searching for information on resveratrol's toxicity, Creasy's assistant, Evan Siemann, uncovered a ten-year-old study describing its effects on rats. In the study, resveratrol significantly reduced the rats' cholesterol levels and rates of platelet aggregation, which have been linked to heart disease. As for toxicity, the rats suffered no apparent side effects, despite the enormous dosages they were administered.

Creasy began searching for resveratrol in wine two years ago. "We decided wine was a nice place to look because when you buy wine off the shelf it tells you what the variety is and it tells you where it was produced," he said. "In many cases it even tells you what vineyard it was produced in. It was like a library, a library of information we could get just by analyzing wine."

His research on wine was published last February in the American Journal of Enology and Viticulture. Of the 30 wines he analyzed, only the reds had high concentrations of resveratrol. The data concurred with one of his previous discoveries that grapes produce resveratrol only in their skin and seeds. According to Creasy, "All red wines are made by fermenting in the presence of the skin. In that process the alcohol increases and the alcohol assists in the extraction of the colored material and tannin material in the skins. And, it also extracts resveratrol."

Creasy's discovery of resveratrol in wine has shed some light on another recent study conducted in France. In that study, French subjects who drank three to four glasses of wine a day substantially reduced their cholesterol levels and coronary blockage. According to Creasy, the wines they consumed were similar to the wines that had high concentrations of resveratrol in his study. The connection may partly explain why the French have a significantly lower incidence of heart disease than Americans, in spite of hav-
“We decided wine was a nice place to look because when you buy wine off the shelf it tells you what the variety is and it tells you where it was produced. It was like a library, a library of information we could get just by analyzing wine.”

Resveratrol may eventually become available in a pure form, such as a pill, but Creasy doubts this will happen anytime soon. He explained that it would take a great deal of time and money before the chemical could receive approval from the Food and Drug Administration. He also mentioned, however, that a friend had recently seen a Red Bordeaux wine extract for sale at their local health store. The extract's label stated that it was high in resveratrol.

Researchers are currently working to introduce the gene which synthesizes resveratrol into other plants. They are also trying to increase the production of resveratrol in plants already capable of synthesizing the chemical. While their intentions are to develop more disease resistant plants, they will also be making resveratrol available in a wider range of foods and in greater concentrations.

When asked to comment on resveratrol, members of the medical community seemed to know nothing about it. In fact, most doctors had never even heard of it. The reason is that there has been little research done on resveratrol. Creasy gave several explanations why the promising chemical has been seemingly ignored.

First, the medical community may be reluctant to endorse resveratrol because of its association with wine. Creasy provided a scenario in which a doctor advises his patient to consume a moderate amount of wine, and the patient sues the doctor after having an automobile accident as a result of excessive drinking. Creasy also said, however, that he receives mail from people whose doctors have told them to drink wine, but in only moderation.

Second, there is a patent on resveratrol. Patent owners must withhold their research from the public in order to protect their product. Therefore, it is unlikely the patent's owners will release their findings on resveratrol anytime soon. The patent also discourages other corporations from investing money into resveratrol research, because they cannot sell the chemical.

Lack of government funding is the third obstacle to research on resveratrol. According to Creasy, it is extremely difficult to receive government funding in the U.S. for research on alcohol, or in this case wine, which is intended to associate alcohol with beneficial effects.

But what about the wine industry? Surely they would be interested in funding research. Creasy has an explanation for this as well. "I really get the feeling the wine industry is controlled by very large corporations regardless of how small the winery may be," he said. "This isn't true in New York, but at least in California and France. There are huge corporations, and among the huge corporations' other holdings is distilled alcohol, and they don't want to support any research that might separate wine being beneficial from everything else not being beneficial. But that's an opinion, you can't really prove that fact."

Creasy will continue his research on resveratrol with some support from private industry. He is currently working with a medical group preparing to conduct a clinical study on the chemical, which will be the first of its kind.

As for now, the verdict is still out on resveratrol. Its effectiveness and safety has not been proven in a clinical study. On the other hand, all the evidence thus far suggests it will become an important part of the healthy diet. Hopefully, resveratrol's researchers will have as much success tackling bureaucracy and research costs as they have had in revealing its potential. ■

by Steven Dickey '94
BEAUTIFUL AUTUMN DAYS FINALLY have replaced the heat and humidity of Ithaca summers. A walk through campus reveals a colorful array of greens, reds and browns stretched high above the Cornell architecture. As you stroll to work birds chirp, the wind blows lightly and leaves fall gracefully from the trees above. What better addition to this fine day than a crisp, juicy apple? Once inside your office you sink your teeth into the apple's shiny, red skin, but you quickly become engrossed in the day's agenda and are forced to place the apple on the corner of your desk. When you reach for the apple on your first break you notice that your delicious fruit has transformed itself into a brown ball of mush.

Ways to prevent or control the chemical reaction that just took place before your eyes have plagued the food industry for years. These enzymatic browning reactions occur when one slices the skin of fruits and vegetables and the enzymes and phenolic compounds in the fruits come in contact with the air. The results of enzymatic browning reactions are common to all fruits and vegetables: brown, wilted lettuce, unattractive fruit slices and discolored wine.

Until recently, food processors relied on sulfite (sulfur dioxide) treatment to prevent browning and softening. However, sulfur dioxide has certain harmful qualities that trigger adverse allergic reactions in asthmatics and other individuals. For these reasons in 1986 the Food and Drug Administration banned the use of sulfites on salad bars and frozen potatoes. Other processes, such as the dehydration of fruit and wine production, require the use of sulfites to prevent oxidation. In order to make prunes, dried apricots and wine available for consumption by sulfite sensitive individuals, Cornell Professor of Food Science and Technology, Chang Y. Lee, and visiting scientist, Jan Oszmianski, worked to develop a natural sulfur substitute.

"Because there are certain products that we cannot produce without sulfur dioxide, we tried to find a possible way to produce them using the traditional ways without using sulfur dioxide," Lee said.

At the Cornell University New York State Agricultural Experiment Station in Geneva, New York, the duo discovered that a honey solution retards the enzymatic browning reactions in apples, apricots, yellow raisins, pears and bananas. According to Lee, honey contains several properties that make it a viable candidate for a marketable sulfur substitute. The honey protein prevents a reaction with polyphenoloxidase, one of the enzymes present in fruits and vegetables. When tissue damage activates polyphenoloxidase, the fruit or vegetable turns brown, softens and loses nutritional value. Honey reacts with the oxidase to hinder browning reactions. Honey also contains a high sugar content, as do fruits, so neither a change in taste nor texture appears. Would the honey solution be as effective for vegetables on salad bars?

"We haven't tried it on vegetables yet because consumers will taste the honey. I don't think people would buy sweet lettuce," Lee said.

In Geneva Lee and his research support specialist, Bob Kime, carried out their experiment by dipping sliced apples, bananas and grapes in honey solution and then placed the treated fruits in a conventional hot-air dryer to dehydrate. The results were much lighter and better quality dried fruits than those without the honey treatment, said Lee. Lee and Kime performed a similar process to make wine.

"Before we crushed the grapes we added honey, then we crushed," said Lee. "That added honey prevented browning."

Although Mayer Brothers apple juice company in Buffalo uses the honey solution as part of their juicing process, Lee's method is not yet commercially used. Since the federal government does permit a certain amount of sulfur dioxide in dried fruits and wines, consumers are unaware of other healthier options. Also, sulfur dioxide is cheap and effective in small doses, Lee said. Ascorbic acid (vitamin C) and citric acid deter the browning process, but each of these is an expensive option. Honey is not as economical as sulfur dioxide. Unlike sulfur dioxide, honey is an all natural food. According to Lee his honey solution discovery most probably will receive recognition once more concrete evidence surfaces about sulfur dioxide's harmful effects.

"I don't know about the future," he said. "Maybe they'll find out that sulfur dioxide is very, very bad and the industry will have no choice but to substitute with something else, such as honey."

Perhaps there will come a day when a simple precautionary step of adding a solution to a crisp, juicy apple will prevent the inevitable browning and softening that ruined your apple on that unforgettable autumn day while you sat at work.
Dr. Malcolm C. Bourne

Dr. Malcolm C. Bourne, professor of food science and technology at Cornell University’s New York State Agricultural Experiment Station, is the recipient of the 1992 International Award presented by the Institute of Food Technologists (IFT). This award is one of the most prestigious honors that can be received by a member of IFT, the largest professional society of food scientists in the world.

Bourne devotes considerable time to solving food processing and preservation problems around the world. He studies problems related to food texture and post harvest technology in areas like the Philippines, India, South America and Western Europe. In his research at Cornell, Bourne also studies international food development and the processing and quality factors of fruits, vegetables, legumes and protein foods.

Bourne is a frequent lecturer on Cornell University’s main campus where he has taught courses and workshops on post harvest food systems and food rheology. Bourne has been a faculty member in Geneva since 1962 and was named a full professor in 1974.

Dr. Malcolm C. Bourne

More Grapes

Robert H. Smith, a junior pomology major in the College of Agriculture and Life Sciences was the 1992 recipient of the Nelson J. Shaulis Advancement of Viticulture Award. This award was established in 1979 to honor Nelson Shaulis, a professor emeritus, for his many contributions at Cornell’s New York State Agricultural Experiment Station, Geneva.

As recipient of the award, Smith spent the summer at the Vineyard Laboratory in Fredonia developing growth curves for grapevines. These curves will help grape growers determine how much fruit to remove by mechanical thinning to ensure their crops reach full maturity each year.

Extension Awarded for Cost Savings

Cornell Cooperative Extension won a $1,000 prize in the 1992 Cost Reduction Incentives Awards Program.

With entries from almost 140 colleges and universities annually, this competition is credited with inspiring savings of over $367 million since it was established 17 years ago.

Cooperative Extension was recognized for creating a training handbook to be used for extension volunteers. Extension estimates that annual savings from staff time reductions made possible by the handbooks will exceed $900,000. Cornell also received an honorable mention for a Transportation Demand Management Program developed in concert with the city of Ithaca and Tompkins County.

Endowment Funds Honor Professors

Two new endowment funds have been established to honor longtime agricultural economics professors Richard D. Aplin, MS ’52, PhD ’59 and Daniel G. Sisler, PhD, ‘62. The College of Agriculture and Life Sciences initiated the funds at the urging of their former students.

The funds will be used to improve undergraduate teaching by supporting new graduate teaching fellowships. As the funds grow, they may also be used to endow graduate fellowships, support lectureships and possibly professorships.

“Doc and Dan have established standards for excellence in teaching that deserve lasting recognition,” said Assistant Dean William G. Boldt in announcing the new funds. “They are enormously popular with students and have received many teaching awards. Establishing funds that will be used to improve undergraduate teaching is certainly an appropriate way to acknowledge their contributions to the College.”

Other Awards Around Campus

Norman R. Scott, vice president for research and advanced studies, has been named president-elect of the American Society of Agricultural Engineers, a worldwide professional and technical organization dedicated to the advancement of engineering applicable to biological systems.

Ronald B. Furry, professor and chair of agricultural and biological engineering, has been elected a fellow of this same organization.

Dr. Lee W. Riley, a physician-scientist in the Division of International Medicine at the Medical College, has been named one of 1992’s PEW Scholars. As one of America’s 20 most promising biomedical researchers, Riley will be awarded $200,000 over the next four years to help support his research on the intestinal bacterium that is the most common cause of infantile diarrhea.

The wood floor in Akwe:kon was named a floor of the year by the National Wood Flooring Association.
In celebration of 90 years of the Cornell Countryman, we dedicate this issue to the artistic impressions that have been on the covers of our magazine over the years. While the world has changed in many ways since the early days of the Countryman, the themes of our articles remain consistent. Shown on this back cover are past Countryman covers that pertain to articles in this issue. Ninety years have come and gone, but the subject matter in the Countryman reveals that people today still enjoy reading about the same subjects that interested our predecessors nine decades ago.
About the Issue

Research plays a vital role in the College of Agriculture and Life Sciences. On the cover is the Biotechnology Building located on the Cornell campus. This issue of the Countryman focuses on research and features articles involving detecting a food-borne bacteria that can lead to death, witnessing the launch of the Mars Observer, perfecting greenhouses and profiling a researcher who has spent her life pursuing parasites. On a lighter note, the topic of food is explored with the rise of specialty food stores in Ithaca. Consumers of kosher and halal foods may also soon be given a greater variety of foods to choose from with the new laws governing accepted standards of preparation. Focusing on the Cornell campus, the Albert R. Mann Library looks to the future with its expansion and Cornell cows win a Super Milk award.

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In Pursuit of Parasites

AT 19, PREMA ARASU KNEW SHE wanted to go into veterinary medicine. She grew up in Malaysia and graduated from The National University of Malaysia in 1978. She was 19 years old when she received a bachelor of science degree in biology. As a young girl, Prema's father took her around to the veterinarians in the area. They discouraged her interest in veterinary medicine because of her gender. However, as a second generation Sri Lankan, Prema grew up with an ingrained value to do well for herself. She pursued biochemistry.

Cornell University was one of several considerations because of its international reputation. However, Cornell did not accept Prema's application and she ended up at the University of Wyoming. "It was a foot in the door for me, they promised me half of an assistantship," Prema said. It was another 12 years before Prema came to Cornell.

In 1978, Prema worked at the University of Wyoming in meat science and biochemistry. "I did biochemical analyses on muscles in comparison to bone marrow and mechanically deboned meat," she said. This work helped toward federal approval of mechanically deboned meat.

Prema's advisor wanted her to stay in meat science but she believed that biotechnology and genetic engineering were becoming very exciting. By 1980, Prema had received a masters of science degree from the University of Wyoming and was working as a doctoral candidate under a molecular biologist at Hahneman Medical College in Philadelphia, Pennsylvania. "I feel I never really had a mentor or why I got into my head but I got this position and it clicked," Prema said. She chose to work on malaria because of its endemic proportions in Malaysia. "There was a certain arrogance just to be studying molecular biology," she stated. For instance, with the malaria project, the parasite was just a tool and a model to do genetic engineering. At that time, Prema's work was more basic rather than the larger picture of trying to find a cure for malaria. Prema finished her doctorate in molecular biology at Hahneman Medical College in 1985. In 1987, Prema attended the International Conference on Malaria in Calgary, Alberta, Canada, where she learned of the biotechnology company New England Biolabs. They were looking for a post doctoral fellow so she flew out to Massachusetts. "They were like a family, I liked that. They had a great set up, not walls. It was an open format with a greenhouse effect. It was informal and we did fun things together on weekends. Most importantly, they seemed to be doing good science, so I decided to go for it!" Prema said.

For three years, Prema identified diagnostic reagents in the filarial parasite *Brugia malayi* which is closely related to heartworm in dogs. She presented her work at an international meeting in Australia and made field trips to Indonesia and Malaysia. In the field trials she used DNA from the parasite as a probe to look for filarial parasite infection in human blood. Regarding the field trials, Prema said, "They were important trips for me. They gave me a feel for the imbalance between the research that is done in a lab and what is really needed in a clinical situation."

For the next two years, Prema was a research fellow at Harvard University studying basic development in a nematode. This research was related to the parasites she had been working on at New England Biolabs. "The first six months I felt overwhelmed," she said. Prema wanted to understand the fundamentals of development in a nematode. This would provide a logical path toward attacking parasitic nematodes that cause many diseases. She realized that studying basic development in a nematode in itself, would be a lifetime of work and more. "I wanted gratification working more closely at the applied end of things," Prema stated. At that time, she knew infectious disease, parasites and molecular biology were her route.

To complement her research background Prema went back to her initial love; veterinary medicine. She now pursues a doctorate of veterinary medicine at Cornell University's College of Veterinary Medicine. "I didn't want a career in pure lab work. Clinical medicine gives me the option of actually doing research of infectious diseases with animals," she said. In addition to school, Prema does post doctoral research at The James A. Baker Institute of Animal Health with Judy Appleton. "Judy studies mucosal immunity to parasites using *Trichinella spiralis* as infections in the rat model," she said. This project keeps Prema actively involved in research while she studies clinical medicine. "It is going to be exciting when I graduate in two years. I'll actually bring research and clinical medicine together. On an international level, it will really give me a foot up," Prema said.

by Lauren Oelkers '94
TO EXPAND MANN’S BASE

THE YEAR 2000, ONCE A FAR-OFF fantasy, is just around the corner. We fantasized about such futuristic expectations of life in the 21st century, but now, we accept the absence of many drastic changes. Cornell's Mann Library is the exception to this realization. By the year 2000, Mann Library will not be the same.

“We’re creating the library of the 21st century,” said Susan Barnes, head of Mann Library’s Public Services Division. “It will utilize electronic technology, but it will be a combination of the most advanced technology and Mann’s traditional collections.”

In about two years, Cornell breaks ground on a 75,000 square-foot, four-story addition to Albert R. Mann Library, which primarily serves the College of Agriculture and Life Sciences and the College of Human Ecology, as well as the Division of Biological Sciences and the Division of Nutritional Sciences. Mann will also renovate its current facility during this project, scheduled to be completed in five to seven years. With this renovation, Mann will be better able to cope with new technologies as they become available.

Why is all of this change necessary? “The primary goal of the construction is to provide for our collections,” said Peter Schrempf, Mann’s administrative manager. The library, completed in 1952, contains a self-supporting stack structure that does not adequately protect the books. Schrempf said the entire structure would incinerate if a part of the stacks caught on fire, due to the outmoded style of construction. Additionally, many of the 650,000 volumes Mann holds need preservation due to the combination of acidic paper and the unfavorable environment they are housed in.

The new addition will extend out the back of Mann’s present structure into what currently is a parking lot. After the completion of the addition, a renovation of the rest of Mann will take place to accommodate advanced computing and telecommunications technology, and to use study space more effectively.

The introduction of computers to library management has had an indelible effect on Mann’s day-to-day operations. Cornell has created an online system that lists holdings of all nineteen units of the Cornell University Library System. Not only are book and reserve checkouts computerized, but the overdue books billing system, the interlibrary loan service and the card catalog are all controlled by computer. In fact, all of Mann’s volumes are listed in the online catalog, so they are moving the card catalogs into the basement to make more room for more computers. These computers will provide access to self-service, public access databases.

The administration at Mann Library has taken advantage of the explosion of computerized information. “Five years ago, we owned just ERIC and AGRICOLA (educational and agricultural databases, respectively),” said Barnes. “Now we own about 120 databases.” Computers made it easier for people to find books, and subsequently, stack use has increased.

Cornell is not the only university responding to the call for technological renovations in the library system. In 1988, Electronic Learning described how the University of Southern California automated its library. University Librarian, Dean and Vice Provost Charles Ritcheson said, “Libraries will have to be prepared
not only to invest large sums in electronics but also to increase their expenditures in acquiring books in the traditional format." Mann Library continues to buy books and periodicals in print, because they only lease the databases, and will lose all the files if they discontinue renting them. Also, the longevity of magnetic tape, the material compact and computer disks are made of, has not proven to be longer than that of books, which can be maintained for decades.

"It is important to emphasize that we are converting Mann to be computer-accessible, but we don't foresee the demise of the printed book," said Sam Demas, head of Mann's Collection Development Division. "It is unbeatable for certain kinds of uses. We will still be collecting printed materials, but now there are a whole lot of different options available to us."

Mann's collections are invaluable when one realizes some of its holdings. Jan Olsen, director of Mann Library, said in a previous issue of *Countryman* that in a number of instances, Mann owns the only copy (or one of the very few copies) of a scholarly work in the United States. Demas feels that this pride should now extend not only to Mann's print collections, but to its new electronic collections as well.

The *Chronicle of Higher Education* published many articles over the past several years discussing the many innovations in library research. It also reported that rising costs and dwindling budgets force libraries to make damaging cuts in collections and services. Mann Library's budget has fortunately kept stable, but inflation and unfavorable foreign exchange rates have forced it to cut some journal subscriptions and at times, to decrease the level of book buying.

The library staffing level has remained relatively stable. However, the staff is called on to do new and different things. They are constantly trained by the new information technologies section of the Mann Library staff, as well as outside seminars and workshops, so they can teach students, faculty and staff to use the library's facilities effectively.

Is this prompting a trend to phase out books altogether in the library system? "The new technologies do not replace the printed word. They supplement it by making searching better and more efficient," said Schremp.

Demas said that the introduction of optical disks and magnetic storage has complicated the job of selecting publications for the library. "Now, we have to determine not only whether the content is appropriate for this library, but which format is better for which audience," said Demas, who agrees with Barnes and Schremp that printed books are still a necessity and a treasure.

The renovations to Mann will better accommodate these new and different options in library information. "There is a need for an advanced technology center for education in the use of the electronic library. Workstations will be spread throughout the library, including the stack areas," said Schremp. Mann's popular reading rooms, traditionally used for facetime, will remain, but will contain these workstations. Campus network connections will also be provided for students who bring their own laptop computers to the library.

Mann will also begin to publicize another innovation called the Gateway system. Anyone who has a computer and a modem can get a user ID to log on to this collection of databases without walking into a library. Currently, Gateway holds eight databases, and it is expanding quickly, adding such popular databases as Periodicals Abstracts (an index to general-interest magazines) and ABI/Inform (a business database). In the one year since Gateway was introduced, over 2700 faculty and students have become active users. This system facilitates the research process, so all people have to do when they come to Mann is go to the stacks to retrieve the books they are looking for.

Why will people go to Mann Library ten years from now? Barnes believes that no matter how computerized library research gets, there are still uses for writing and reading. "Students use Mann to obtain educational resources and also to socialize, network and share information about classes," said Barnes. "They will have a wired library where students will be able to work together."
FOOD SAFETY HAS ALWAYS BEEN OF concern to consumers. For the average individual, most cases of food poisoning result in a few days in bed and nothing more. However, food safety has become increasingly important among the rising population of immunocompromised individuals, those individuals with a condition suppressing their natural immune systems. These individuals are predominantly dominated by HIV infected people, transplant patients, the elderly and pregnant women and their fetuses.

Academic and commercial sectors have demonstrated through their work the need for greater diligence in establishing levels of food safety and methods of prevention. Recent outbreaks of a disease called listeriosis, contracted through a food borne bacteria, have led to increased interest in developing detection methods. In 1985 to mid 1989, England, Wales, and Northern Ireland experienced a near doubling of the incidence of human listeriosis.

Associate Professor Carl Batt, of the Department of Food Science in the College of Agriculture and Life Sciences, has been working on research involving rapid detection of the bacteria causing listeriosis, Listeria monocytogenes. This bacteria is found in dairy and meat products, fruit, seafood and raw and processed vegetables. A Countryman article written in October 1990 called 'Detecting Listeria,' noted the use of monoclonal antibodies or antibodies geared toward a specific antigen in the detection of L. monocytogenes. Since then a more general technique has been developed that can be used to detect L. monocytogenes as well as other bacteria. Sponsors of this research are the Cornell Biotechnology Program and the Northeast Dairy Foods Research Center.

Historically, L. monocytogenes was primarily a threat to livestock, however, evidence of it being a cause of human disease became apparent in the 1920s. L. monocytogenes is the bacterial species most responsible for causing abortions, meningitis and septicemia among both animals and humans. “This organism is found everywhere but only affects certain types of people,” said Batt. As a soil bacteria, he added it is natural that this bacteria is found in many foods.

Exposure to the bacteria causes no more than influenza-like symptoms in an average person but could lead to death in immunocompromised individuals. A study conducted by the Centers for Disease Control during November 1988 to December 1990 reported that in an average population of one million people, only 7.4 cases were reported. However, the mortality rate of those infected with L. monocytogenes was twenty-three percent and other studies have shown a mortality rate of as high as thirty percent.

L. monocytogenes is a difficult bacteria to detect because it occurs in very low levels in food and is similar to other species within its genus. “The problem with this organism is that at the time we started this work seven years ago, there were not a lot of distinguishing signatures,” said Batt. Batt described signatures as distinguishing characteristics that aid in differentiating between, in this case, two species of bacteria belonging in the same genus.

Even though L. monocytogenes occurs in low levels in food, the presence of one
bacterial gene could be a problem because under the right conditions, it could multiply. The bacteria can incubate for 30 days making it difficult to determine a link between the contaminated food and symptoms.

Batt's work involves developing a way to distinguish L. monocytogenes from other species in the same genus which are not pathogenic. His work consists of finding distinct signatures or distinguishing characteristics that are unique to this bacteria. In collaboration with Francis Barany, a microbiologist at the Cornell University Medical College in Manhattan and the inventor of ligase chain reaction, LCR, the use of LCR became the chosen route to easily distinguish L. monocytogenes from other Listeria species.

"LCR gives you the ability to detect the difference between two DNA sequences that differ by only a single nucleotide," said Batt. Nucleotides are the building blocks of DNA. By examining bacteria through LCR, it is possible to look at one nucleotide out of approximately three billion and distinguish between two species of Listeria. Martin Wiedmann, a visiting fellow from Germany in the College of Agriculture and Life Sciences has also

played a substantial role in the development of this method.

The decision to use LCR came about because, "we were looking for the potential for devising a strategy that would be generic," said Batt. Barany and Batt both felt the need to develop a technique that could be used to distinguish other bacterial pathogens.

The technology has also been applied to a plant pathogen, Erwinia stewartii, with the help of Wendy Wilson, a graduate student in the Department of Plant Pathology.

"LCR has also been licensed from Cornell Medical College by a company called Applied Biosystems," said Batt. "Applied Biosystems manufactures instruments used in molecular biology. One of those instruments separates DNA molecules by electrophoresis." Electrophoresis is the separation of molecules principally based upon size and the instrument is equipped with a laser scanner that facilitates the discrimination between two different DNA molecules. The starting assay materials of the LCR are short pieces of probe DNA and the product of a positive reaction, one where L. monocytogenes is present, are joined pieces of DNA. The laser scanning process makes it easy to distinguish between joined and unjoined pieces. He went on to say that Emily Winn-Deen at Applied Biosystems, based in Foster City, California, is leading the group that is working with this technology to expand the uses of their instrument.

Batt commented that there were economic and political issues that would determine the practical application of this technology. "There are then commercial considerations that will determine if we're going to do anything with this." He feels that prohibitive costs of using this procedure could prevent its application in the food industry. Since it is virtually impossible to eliminate L. monocytogenes from food products, the question arises as to what levels of the bacteria in food are safe. Presently, the levels of bacteria that are sufficient to cause infection are not known.

"The global issue is one of what is really a food safety problem," said Batt. Since listeriosis only affects a small number of people in a population, requiring higher food safety standards must be weighed against the economic costs involved in implementing regulations.

If the process were used to test a

Twinkie for L. monocytogenes, Batt said the procedure would not be practical. "If you're testing end products then it doesn't make a whole lot of sense," said Batt. He felt that identifying and modifying those parts of the food processing procedure that may be most sensitive to contamination would be the most realistic use of this technology. "It all comes down to economics. You want to test those areas that will most likely be a problem," said Batt.

Until the technology is applied in the food industry, the Centers for Disease Control has recommended that all consumers avoid the consumption of unpasteurized milk or foods made from unpasteurized milk. People at high risk, those with immunosuppressive conditions, should avoid eating soft cheeses and undergo dietary counseling.
And so began another day at the dairy department of the teaching and research center in Harford, New York. According to Ron Space ’53, the Chief of Operations for the Department of Animal Science, Cornell is home to the largest accredited animal care facility in the United States. Day to day activities include caring for the cattle, milking and feeding the cattle and carrying out the hundreds of experiments that take place at this center.

Currently 400 cows roam the premises of the teaching and research center. Each of these cows produces approximately 100 pounds of milk daily at peak lactation. The milk is then sent to the food science department where it is processed and sold as ice cream, cheese and milk at Cornell stores, or served in Cornell’s dining halls where it is a wonderful complement to a chocolate chip cookie.

The milk that eventually arrives on campus is no ordinary product. In fact, in 1991 the milk produced by the Cornell cows received the Empire State Mastitis Council Super Milk Award, the highest honor awarded to milk makers. The award commends the high and pure quality of the milk. “Basically,” said Gladys Birdsall ’78, the Dairy Coordinator, “the award is an indication of the overall health of our herd.” While the cows themselves obviously play a major role in providing this exceptional milk, the unsung heroes are the staff members who devote their time to insure that Cornell’s facility and its cattle keep up the high standards that make the operation an udder success.

Gerry Phelps, the milking crew supervisor, has been working at the center for 20 years. His tasks include maintaining the milk house and overseeing the entire milking operation. Phelps also monitors the intricate computer systems that regulate milk quantity.

“It’s very nerve-wracking and tedious around here,” he said. Stress is particularly high when the state and federal inspection teams come to examine the equipment and the center. Since these visits are unannounced and occur every six months, Phelps works diligently to keep the center an immaculate and healthy environment.

Lynn Goddard is another of the center’s hardworking staff members. Goddard spends her days feeding the calves, taking care of the newborns and treating the calves when they are sick. Since she knows the calves on a personal level, she also plays a key role in picking

Wayne Daniels at work in the milking parlor.

One of the young calves peers out from its home.

Gerry Phelps is the Dairy Coordinator for Cornell. Here he pets Cookie, who is one of his favorite cows.
calves for research projects. She said her work is very satisfying; it is almost like she is a mother to the animals. "I try not to become attached, but sometimes you can't help it," she said. "Some of the calves just have such a nice personality. I even call them my kids sometimes," she said with a smile.

Tom Muscato, an experimentalist who helps with the research on dairy cattle, agreed that it is difficult not to become emotionally attached to some of the cows. When you spend all day with them, you cannot help picking favorites, he said.

Muscato, with the help of Birdsall, coordinates research projects with Cornell professors. Since the center opened in 1972, 500 projects have been implemented by the staff in conjunction with Cornell professors. Results of the studies often lead to innovative discoveries in the dairy field that filter down from the professors conducting the experiments to the everyday dairy farmer. Often the results set new precedents in the field.

One of the studies currently underway at the center examines the changes in milk quality when the cow is milked three times per day as opposed to the usual two times per day. Several enzymes exist in the milk that may begin to break down the milk while it is in the cow's udder; researchers are testing whether removing the milk more frequently will reduce the enzyme activity and improve the quality of the milk.

Although the day-to-day activities vary little at the center, the employees never seem to tire of their responsibilities. Part of this enthusiasm flourishes simply from the workers' love for the cattle. Many of the staff members grew up working on their families' farms and continue to do so. Space said his interest in pursuing a career of this sort relates back to his upbringing. "I'm just a common little dairy farmer," he said. Phelps, Birdsall, Muscato and Goddard all expressed similar sentiments. For example, Birdsall grew up on a dairy farm in Delaware County, New York. Judging from the sincere and concerned attitudes that the staff members express for cattle, the reasons the center is so successful are crystal clear.

As long as the cows remain at the center in Harford they can be assured that they will receive world class attention from the staff. Not to mention a few baby gifts from their "parents."  

by Alison Oshinsky '93
THE GREENHOUSES OF THE FUTURE are here at Cornell today. Controlled Environment Agriculture, or CEA, is the name given to both this leading-edge agricultural technology and the new program of study at the College of Agriculture and Life Sciences. The CEA study at Cornell focuses on researching intensive, year-round crop production in state-of-the-art structures, while at the same time training the people who will successfully implement and manage this technology in the future.

Currently, the major use of CEA in New York state is flower production. Over 350 acres of greenhouse area produce crops valued at $94 million dollars annually, averaging over $250,000 per acre. The U.S. national average is about $240,000 per acre annually from the 9,300 acres in flower production. Professor Robert Langhans, MS '54, PhD '56, the CEA Program Director, believes food crops can also be profitably grown year-round in the northeastern United States using properly designed and managed CEA systems.

"Up to this point, food production in CEAs has failed," cautions Langhans, "because big business looked at CEAs as 'simple' farming. They didn't realize how detailed and sophisticated a CEA was to operate. Growing quality crops consistently is very difficult, but a successful CEA is a money machine." CEAs fail because no one is trained in the complexity of Controlled Environment Agriculture operations, he said. For example, dealing with excess water run-off in a CEA is a problem.

Researchers at Cornell are exploring two basic types of zero run-off systems. One is a zero run-off system for crops grown in soil. The other is a recirculation, or hydroponic, system. While both systems attempt to provide an optimal growing environment, free from pests and diseases, with perfectly timed and abundant daily harvests of fresh food, each system seeks to address different agricultural problems.

Martha Jensen, a technician working on the project, reads the pHs of nutrient solutions that are used in the hydroponic systems. The nutrients circulate throughout the system and are replenished as needed.
The zero run-off system is designed to prevent excess fertilizer from polluting the environment. Over 2,000 pounds of nitrogen fertilizer per year can be applied to an acre of greenhouse under usual greenhouse conditions. Outdoor farming, by comparison, uses 150 pounds of nitrogen fertilizer per year, or less. In a conventional greenhouse about 62 percent of the fertilizer leaches out to surface and ground water. According to Professor Thomas Weiler, MS '67, PhD '69, a CEA faculty member researching the closed-cycle nutrient flow in the CEA study, fertilizer over-use is not a financial issue, as the cost of fertilizer is only a few percent of the greenhouse budget, but it is an environmental issue.

cycle it through a constructed wetland inside the greenhouses, where the unlimited retention time of nutrient-rich water allows aquatic plants and their associated microbes to absorb and otherwise metabolize nutrients and pesticides. Salt-tolerant plants (halophytes) then transpire pure water back into the air, further absorbing and concentrating the nutrient salts in the wetland. Chris Pickrell, a graduate student, who has built just such a constructed wetland within a greenhouse as part of the CEA project, researches how well such a system operates. Pickrell said there is always some nutrient waste left over, however, and the CEA industry needs to devise some kind of on-site treatment process for the waste.

Just as the zero run-off CEA system is designed to meet the needs of today's growers, the hydroponic CEA system is being designed to meet the needs of the future. According to Weiler, plant growth is subject to the "law of limiting factors." Optimized growth is a CEA goal, but optimum is very difficult to achieve.

In the hydroponic CEA almost every environmental factor is computer controlled. Crops are not grown in soil, but in a liquid nutrient solution. The temperature, carbon dioxide and humidity are precisely regulated, and no pesticides or herbicides are used. Insect pests are controlled by Integrated Pest Management, using beneficial insects to regulate the population of harmful ones. In this near-optimum environment the amount of available sunlight becomes the "limiting growth factor." To maximize this final factor the CEA study uses supplemental lighting. They are also testing a state-of-the-art light source that produces very little ultra-violet and very little heat; a great percentage of the energy is converted to visible light. This new lamp has no electrode; it is powered by microwaves.

Part of the future of CEA may be out of this world. NASA has asked the Cornell CEA group to study the feasibility of a Controlled Ecological Life Support System, or CELSS, for a colony on the Moon. CELSS are CEA's within a total system for humans. As Langhans puts it, "Without CELSS there will be no lunar colonies, only a lunar station that is resupplied, such as the Antarctic stations that are supplied with food every six months."

Who is going to build and operate the lunar CELSS? Perhaps graduates of Cornell's College of Agriculture and Life Sciences, trained in the Controlled Environment Agriculture program. Think of it: working on the Moon, or even on Mars.

by Richard Ginn '94
Report from Cape Canaveral

A Titan III launch vehicle.
FIRE WELLED UNDER THE ROCKET, and a huge cloud billowed around the launch pad. The spacecraft lifted slowly and climbed into the sky. Several seconds later, the noise of the ignition across the water hit us. The craft rose and dissolved into the clouds, the deafening rumbling of the rocket boosters pounded the air between us and the spacecraft itself. The noise, the fire and the excitement was compounded by the cheers of the spectators, and was more awe-inspiring, emotional and thrilling than I can possibly describe.

The Mars Observer (MO) spacecraft launched on Friday, September 25, 1992. Two days earlier, I had been standing on a corner in Ithaca at 7:00 am, with my suitcase. Two friends of mine picked me up, and we began the long drive to Cape Canaveral. I was alive with the excitement of this opportunity. Here I was, headed for the launch of what will, hopefully, become one of the most important spacecraft missions in the history of space exploration! I was thrilled to be able to go. I'm a senior in the communication department of the College of Agriculture and Life Sciences. I was able to attend the MO launch because I have worked in the Department of Astronomy since I was a freshman. My boss is a mission scientist and he invited the students who work for him to attend the launch.

My two travelling companions and I were to meet up with other people from the Cornell astronomy department, both undergraduate and grad students, and our boss, Associate Professor of Astronomy, Steve Squyres BA '78, PhD '81. All in all, about 10 people from Cornell attended the MO launch.

Mars Observer is a global mapping mission. The spacecraft will look at the entire surface of the planet with various types of scientific instruments, enabling scientists to locate and identify surface features, minerals and even individual elements. Astronomers have studied Mars for centuries, but even after two missions to Mars in the 1970s, Mariner and Viking, relatively little is known about the red planet. Mars Observer will provide a tremendous amount of information about our neighboring world, much of which will aid, through comparative studies, in the understanding of how Earth was formed and evolved.

Before MO can even begin mapping the red planet, however, it has to get there. The actual launch of the spacecraft was what prompted several students associated with Cornell's astronomy department, including myself, to leave Ithaca during the first round of exams this semester and drive to Florida for the weekend.

We arrived in Cocoa Beach, Florida at around 10:00 pm the night before the launch. We met up with the rest of our party, all of us tired and grumpy from the trip. A swim in the ocean seemed in order, so we walked down to the beach, only 100 yards from our hotel, and went for a swim. The water was unbelievably warm, and the night was clear. Standing hip deep in the ocean, we could see the launch pad on Cape Canaveral, where the Mars Observer spacecraft waited for the next day when it would begin its journey to another planet. The weather and water were so pleasant, it seemed to me an indication that everything would go smoothly the next day for the launch. We went to bed nervous just the same. It wasn’t too late for something terrible to happen and destroy the mission.

The Launch

Friday morning, I woke at 6:30 am and was ready for the big day. Bleary-eyed, we found the registration site for guests of the mission and picked up our information and passes for the launch. We then headed for the Kennedy Space Center for a briefing and the launch.

At the space center, we were loaded onto busses and taken to the causeway, where we awaited news of the 12:30 pm launch. We had not yet received official word that the launch would take place as scheduled. The scientists were watching the wind, hoping to hear that the launch could proceed.

The wind that morning was blowing in the wrong direction. The spacecraft,
encased in a Titan III launch vehicle, was going to head east in an earth orbit before being propelled into space and on towards Mars by another rocket booster. The winds were blowing east to west. This meant that the toxic fumes, should the launch vehicle explode during or shortly after launch, would be blown west across inhabited areas of Florida. MO could not be launched if there was a risk to populated areas.

At about 11:00 am, we got official news that the winds had shifted and the launch could go on as scheduled. Excited and relieved that our long drive would not be in vain, we sat in the grass across the Banana River from the launch pad and waited for ignition.

The launch actually took place, after only slight delays, at 1:05 pm.

Several of us snapped off some pictures as the vehicle took off, but as it cleared the launch pad, cameras came down and voices rose. Everyone was either jumping up and down, cheering or staring with their mouths open. It was truly amazing and terrific to see, hear and feel the Mars Observer, inside its Titan III launch vehicle pull away from earth, never to be seen again.

And then . . .

The emotions were about to turn. Immediately after the launch we boarded our busses and went back to the Kennedy Space Center, where we watched on a movie screen the live broadcast of Mission Control scientists from Houston. There were about 500 people in the theatre, all eyes glued to the screen, all ears intent on the audio broadcast.

Mission Control was expecting to receive word from a couple of different ground stations of a transmission from the Transfer Orbit Stage (TOS) rocket booster, which gave the spacecraft the extra push to escape earth's gravity and head for Mars. When we arrived at the space center theatre, nothing had been heard. Time passed, and still no transmission from the TOS, nothing indicating the flight was proceeding as planned.

Faces were falling at an alarming rate. Then, we heard a transmission. An airplane flying over the Indian Ocean radioed back to Mission Control that they had observed a bright, orange flash in the sky, at about the expected coordinates of the craft.

An indescribable silence filled the room. Had the Mars Observer spacecraft blown up before even leaving its home planet? I looked over at Steve, hoping for hope, and my heart broke. The expression on his face revealed his dismayed and shattered heart. Clearly, Steve thought the mission had gone up in smoke. It would be 40 minutes before the next stage at which Mission Control could know anything for sure.

I was not yet personally attached to MO, because in the preparatory stages, there was little for an undergraduate to do. However, I have worked for Steve for three years and I could not bear to see him in such obvious pain. His expression might have been the same had he been watching his house burn. With tears on my cheeks, I asked one of my friends to go for a walk with me. I could not sit in that room for 40 minutes and see Steve look that way.

A half hour later, we returned to the theatre. As we approached the entrance, I heard cheers and applause. I broke into a run. On my way up the stairs to the doors, I was nearly knocked over by Steve, who burst out of the theatre and ran down the steps in his excitement. He grabbed my hand and yelled, “We got x-band!” He ran out of the building.

While I was gone, the spacecraft (which had not exploded) continued on its scheduled trajectory. At a certain, expected point, Mission Control “acquired x-band,” which meant to us that the spacecraft itself had started transmitting at just the right time and place. When that transmission was received, it became apparent that the spacecraft was travelling toward Mars as planned. The problem had only been that the TOS transmitter had failed. The orange flash was the TOS rocket boosters igniting, as scheduled.

The After-Launch Celebration

Upon returning to the hotel, Steve suggested a party to celebrate the day’s success. We all agreed, but after the long day, with its emotional ups and downs, we were hungry and ragged. Before any kind of celebration, we needed to eat! I went out to dinner with a group of students to celebrate and talk about the day. We found a cute little Chinese res-
beer and invited the GRS team to our room to share the happiness.

After the toasts and introductions, I had the opportunity to meet and talk to some wonderful people at the launch celebration party. I spent a great deal of the evening talking with a professor from the University of California at San José about my upbringing and education in New York state, compared to his in Europe. We talked about my faculty advisor, my career interests and whether or not I should go on to graduate school. (On this point we debated back and forth for what seemed like days. He strongly encouraged me to go on immediately to earn master's degree. I said, “In what? I don’t know what to study!” His response? “It doesn’t matter. Just do it.” We never did agree, but the conversation was fun and very interesting.)

I also had the opportunity to talk to Steve outside of the office. I was delighted to have the chance to talk to him, especially about my career interests. I have been working for Steve for three years, but I wonder if he ever really understood what I’m trying to do with my life. I doubt he understood the tremendous influence my job has had on my career interests and goals.

When I applied to Cornell, it was clear-cut. I would study communication; I would fill every free credit hour with biotechnology and related courses. When I graduated, I would go to work for Merck and Co., Inc. or Genentech and write about scientific advances in the biotechnology industry. That goal has now been pushed aside in favor of planetary science.

When I applied to Cornell, I didn’t know Venus from the Sun. My job in the astronomy department and especially the opportunity to be involved with planetary missions at the level of cutting-edge research has opened to me a new and wonderful world. Being allowed to attend the launch of the MO was just another way my job has influenced my career intents.

I will graduate from and leave Cornell before Mars Observer reaches Mars, and therefore may never see the data sent back by this magnificent spacecraft. Even if I don’t stay in astronomy and I only see what few results of the mission that are published in popular science magazines, I will always be thrilled and proud that I was given the opportunity to experience this landmark in the history of space exploration.

by Lesley J. Wright ’93
A young boy and his grandfather walk down a city street to a small corner bodega. On route, they pass an elderly woman shuffling through the fruit at a local produce stand. Just across the street, the butcher’s window sign is flipped to “open.”

If you are from New York City or any other major metropolitan area, the aforementioned scenario is probably taken for granted. Specialty food markets, like those listed above, have been operating for decades. However, while these stores once primarily existed only in cities, they are becoming increasingly successful elsewhere in the country.

Agricultural economists have supported this trend with their findings. The *State of New York Food Industry*—a study issued in February 1992 by the Cornell Food Industry Management Program in the College of Agriculture and Life Science’s Department of Agricultural Economics—offered firm statistical backing. It reported that supermarkets (classified as grocery stores with an area of more than 5,000 square feet) account for only 14.5 percent of the 12,395 food stores in New York state.

Excluding New York City—where supermarkets account for only 8.3 percent of food stores—less than 19 percent of New York state groceries are considered supermarkets. Moreover, although the Central Region (which includes Ithaca) of New York has the highest percentage of supermarkets in the state, they make up only 22 of 100 food venues.

While today's society is becoming increasingly health conscious, there is a more meaningful reason for small market prosperity. This is especially the case in Ithaca. “Specialty stores are not a new phenomenon by any means,” said Rod Sayet, a partner in the Oasis Natural Grocery. “It’s very upscale and educated.”

While income and schooling of customers impact markets' success, numerous other causes exist. First and foremost is the previously noted health issue. Organic foods are the featured fare of many smaller markets. Such products, which are grown without pesticides or fertilizers, are safer for the environment. In addition, organic foods aren't harmful for people who are chemically sensitive.

For example, liquid ammonia, which pays off immediately when used as a fertilizer, may hinder the soil in the long run. However, while farmers save money on chemical-free agriculture, the price of organic produce won’t drop because more labor is involved in its growth.

Oasis, said Sayet, sells grocery items with no preservatives, chemicals, or artificial flavorings. In fact, he noted, their best selling item is Knudsen Spritzer, an all-natural carbonated fruit beverage. Greenstar and Ludgate Produce Farms also sell organically grown produce. In an effort to compete, according to Assistant Store Manager Brian Seeley, Wegmans Food Pharmacy, an 89,000 square foot supermarket.

The Wegmans produce section: Wegmans is an 89,000 square foot supermarket.
square foot supermarket, bakes organic whole wheat bread on site and uses unbleached flour in the process.

Mike Ludgate '80, general manager for his family's business, explained his purchasing strategy for large volume crops such as sweet corn and pumpkins. "We try to find a farmer who'll grow and deliver the crop just for us," he said.

Ludgate and the other small marketers added that they prefer to buy produce locally when in season. "Of course in the dead of winter, we, like everyone else, buy food from Florida or California, which is available through the Syracuse Regional Market," Boggess noted. Wegmans, on the other hand, gets its produce through a buyer in the chain's main office in Rochester.

While Wegmans must rely on a more rigidly structured, decentralized hierarchy, the reasons for its competitors' success are not lost on Assistant Manager Seeley. "They want to create a European-type market," he said, "where everything is open and visible to customers so they can actually see the processing of the product."

Boggess continued this line of thought. "You sell more cheese if people see you cutting cheese," she reasoned. "People like to see how the produce is prepped. It makes people feel that products are less mysterious."

Extension Associate Hawkes brought the eye-it and buy-it issue full circle. "That's the philosophy Wegmans is trying to copy with its perimeter departments in bakery, cheese, meat, deli, and seafood," he said.

Aside from changing to suit the specialty customer, Hawkes noted that the supermarkets do have benefits. "Perhaps the greatest advantage the supermarkets have over the specialty stores," he opined, "is the ability to track their sales using computerized checkout scanners." In addition, supermarkets have the ability to buy in larger bulk and Wegmans' credit card technology is consumer friendly.

The specialty store response has been marked. A store such as the 2,400 square foot Oasis, for example, can't afford scanning unless the technology undergoes a marked price decrease. In these cases, the small markets turn to service and unique items to woo consumers.

Oasis offers an international vegetarian deli. Greenstar co-op, which has 3,000 members, allows its members to make product line decisions. "It's the ultimate form of democracy," Boggess said. "Now we even have a referendum about some controversial meat and packaged products we carry."

Ludgate Farms, like Greenstar, allows its customers to purchase products in bulk to save money. "A lot of people tend to think that specialty food stores are expensive," Ludgate reasoned, "but we really work at trying to keep the prices competitive." Furthermore, Ludgate added, in compliance with New York state's food labeling law, his store has a computerized scale which knows the ingredients of all products sold. "It sure saves us a lot of time," Ludgate noted.

Finally, in another "please the consumer" gesture, Ludgate Farms' business policy doesn't require customers paying by local check to show identification. "Once in a while we get a bad check," Ludgate admitted, "but it's friendlier and people really appreciate that."

by Dan Masonson '94

Patti Arsenault at the register at Ludgate Produce Farms.
AT AN INSTITUTE OF FOOD TECHNOLOGY symposium addressing the dietary laws of different religions, a rabbi put his arm around the shoulder of a Muslim speaker. The two sat, leaning toward each other, conversing quietly for 15 minutes.

While news stories about the clashes between Jews and Muslims are all too familiar, some members of these religions are learning to work together to make more food products meet their dietary regulations.

Professor Joe M. Regenstein ’65, MS ’66, of the Department of Food Science in the College of Agriculture and Life Sciences is an expert in the field of kosher laws, the Jewish dietary restrictions of all kosher-marked products purchased intentionally in the U.S. are purchased by Jews. The bulk of the other two-thirds of the $1.6 billion worth of intentionally purchased kosher-marked products consists of approximately equal numbers of Muslim and vegetarian consumers.

There are many similarities between kosher and halal laws. For example, both provide for the humane slaughter of meat and both restrict the consumption of pork. In fact, under halal law, Muslims may accept kosher products in the absence of halal products.

These similarities have united Jews and Muslims in organizations, like Certified Shipping, Packaging and Transport, Inc. (CPST), that have brought about changes in food-related industries. In CPST, representatives from kosher and halal certifying agencies work together with steel and lubricant manufacturers to stop the use of coatings that contain animal-based fats in the production of steel food containers. As a result, many U.S. manufacturers have stopped using these coatings and manufacturers in other countries are beginning to stop as well.

Despite the similarities, there are several areas in which kosher and halal laws differ. Even though both sets of laws require a live and humane slaughter, each has a unique set of rituals for the performance of this slaughter. Under the Jewish laws, the shochet, or slaughterman, says one prayer and then kills for a period of time, whereas the Muslim slaughterman prays to Allah before each animal is killed.

Likewise, although both sets of laws restrict the use of pork, the restrictions imposed by halal laws are stronger than...
those imposed by kosher laws. Any contact whatsoever with pork is unacceptable to the Muslims. Jewish law, on the other hand, permits limited use of pork gelatins, such as precipitating agents in juices, because the gelatin is not a part of the final food product.

Even these differences, however, are uniting Jews and Muslims. Most of Regenstein’s work, for example, focuses on the areas of “interface” between kosher and halal laws. Slaughter practices and the use of pork gelatins fall into this area where kosher and halal practices are similar, but also have significant differences.

Regenstein hopes to establish a set of guidelines for change so that kosher products will meet the dietary needs of the other groups who consume kosher products. Ideally, these guidelines, which Regenstein refers to as “Regenstein’s Ten Commandments,” will be publicly stated and enforced by both rabbis and members of the relevant food-related industries. Products meeting the higher standards set forth by “Regenstein’s Ten Commandments” would be marked with a “hooked R” to symbolize the hooking of other religions to the kosher laws.

Regenstein and others working in this area are planning to renovate a beef slaughter plant so that these standards may be put into practice. Ideally, the plant would do three things. First, it would make the hind-quarter of beef available to Muslim markets. Cuts of meat results of the efforts to prevent the use of animal-based fats in steel containers have been approved by both Jewish and Muslim certifying agencies.

Despite their differences, these projects provide an opportunity for Jews and Muslims to work together in the U.S. on common ground. According to Regenstein, “Members of each group have been able to focus on their common needs and avoid those areas where they might disagree.”

As a result, at a recent CPST press conference in Pittsburgh, Jews and Muslims who observed religious dietary restrictions ate food acceptable to both at one table, while everyone else ate “regular” banquet fare at another.

Common Ground

In addition, Muslim-supervised kosher slaughters would ideally be provided at the slaughter plant. A Muslim would be present while kosher slaughter takes place to say the appropriate blessings. Finally, the plant would operate on the Sabbath, the Jewish day of rest, as a halal plant with a Muslim slaughterman.

Jews and Muslims are also working together to develop a gelatin that meets both kosher and halal requirements. As a result of these efforts, two companies now make fish gelatins that meet these needs. In addition, two laboratories claim they have produced more versatile fish gelatins than those currently available.

These joint efforts of Jews and Muslims have apparently been accepted by both religious communities. For example, products are kosher marked.”

by Jacqueline K. Lurie ’93
What possible interest could Cornell Cooperative Extension have in Long Island: land of hairspray, shopping malls and sports cars? People rarely consider the important agricultural component of Long Island, New York. Cornell Cooperative Extension in Suffolk County provides programs to support agriculture on Long Island, as well as a tremendous variety of other programs, including those in economics, nutrition and the environment.

A Brief History:
Congress established the Cooperative Extension Service nearly a century ago. It primarily addressed the needs of the agricultural community, although there were some home economics programs as well. This national extension system was administered at the land-grant university in every state, and provided an effective means to promote new technological and agricultural advances.

Extension education today differs dramatically from those early days. Jane W. McGonigal '50 PhD '84, a former editor of the Cornell Countryman, is the Director of Staff Development and Recruitment of Cornell Cooperative Extension. She stated, "There is a change from a focus on farm and home production to where one must solve issues as well." McGonigal attributed part of this change to the overall decrease in the number of people involved in agriculture. In 1900, 45 percent of the population was associated with agriculture. Today only two percent of the population is in an agriculture-related field.

In a similar trend, agriculture on Long Island changed dramatically over the years. Early settlers primarily focused on livestock, hay and the export of firewood. Later, fruits and vegetables provided the principal sources of agriculture. According to a flyer published by Cornell Cooperative Extension, "The peak production of potatoes on Long Island occurred just after World War II, when over 120,000 acres were cultivated in all crops." After this period, "development of the nursery, sod and greenhouse industries increased" on Long Island. To keep abreast of rising property taxes and labor costs, farmers had to produce more profitable crops or leave agriculture. Vineyards, which produced premium vinifera grapes, evolved as one of the more lucrative agricultural industries on Long Island.

Land use changes and other pressures of a modern consumer society have forced extension services to deal with many other issues.

Program Areas:
Across New York state, Cornell Cooperative Extension education programs focus on six principal issues:
• Agricultural Competitiveness and Profitability
• Children and Youth at Risk
• Economic Vitality
• Environmental Protection and Enhancement
• Individual, Family and Community Well-Being
• Nutrition, Health and Safety

In Suffolk County, Cornell Cooperative Extension focuses on three of these key issue areas: Environmental Quality, Economic Development and Development of Human Potential. Kathleen DeMarco, a Cornell Cooperative Extension agent in Suffolk County stated, "We still do the traditional agricultural and marine extension work, but we incorporate them under these three issue areas."

Environmental Programs:
The fragile ecology of Long Island, with coastline on both Long Island Sound and the Atlantic Ocean, engenders extensive environmental programs. DeMarco cited the importance of extension agent Emerson Hasbrouck's work for the maintenance of water quality in Suffolk County. A clean water source is critical to Long Islanders since much of the population depends on local wells for water. Other marine programs focus on the preservation of wetlands which act as a natural filtering system for pollutants.
Agriculture—And More

The Suffolk County Extension Association also addresses ways to make pesticide use more precise to limit its negative effect on the environment. Cornell Cooperative Extension is the lead educational organization for "Integrated Pest Management" as an efficient and effective way to control pests.

Another program of the Suffolk County association helps consumers learn to reduce the waste they produce through "environmental shopping." DeMarco described this as a project which alerts people to excessive packaging in grocery stores. Through this home economics endeavor, extension encourages people to purchase reusable products that have minimal or recyclable packaging.

Economic Vitality:

DeMarco also mentioned several programs that aid the economic development of Suffolk County. One program focuses on the commercial tuna fishing industry. Much of the tuna caught off the coast of Long Island has a red appearance when it is displayed in retail fish markets. However, another common variety has a lighter color. Although the two types are essentially the same, consumers often do not purchase the pale-colored tuna because they think it is spoiled. As a result, the wholesalers who sell the fish suffer a monetary loss. The extension program attempts to educate the public to the fact that the two types of fish are essentially the same.

Human Service Programs:

There are difficult economic conditions throughout Suffolk County; New York Newsday recently reported that 100,000 jobs were lost on Long Island. As a result, demand for human service programs increased. For example, DeMarco described food education efforts that help people who have limited resources but do not qualify for food stamps. Other programs explain nutritional information, credit basics and budgeting skills for individuals and households.

The Suffolk County association also provided aid for victims of the hurricane in Florida in August, 1992. There were 27 collection sites throughout the county for food, clothing and baby food. The supplies were gathered by a 4-H group in Suffolk County and distributed through a 4-H group in Dade County, Florida.

Other human service programs focus on health issues such as the AIDS crisis. A flyer distributed at the Suffolk County extension office stated, "Long Island has the highest incidence of AIDS of any American suburb." A new program, which originated at Cornell University in the College of Human Ecology, targets the need for communication between parents, schools and students. This pilot program recently won an award from the National Association of Counties.

Communication of Programs:

Cornell Cooperative Extension depends on effective communication for the success of its programs. McGonigal stated, "Extension is unique in using non-formal education, which includes workshops, demonstrations, self-directed learning, computer learning and volunteers as multipliers."

The Suffolk County Cooperative Extension office relies on a variety of communication methods to disseminate its information. DeMarco said that the Suffolk office works closely with daily and weekly newspapers, radio and television stations to launch news releases on extension issues. In addition, current technology allows for satellite teleconferences, computer databases and audio "on-line" communications. For Suffolk residents, the Extension Association provides: Home Horticulture Diagnostic Lab, Consumer Help Line, Marine and Sea Grant Program and the Expanded Food and Nutrition Education Program.

Sod farms are often found on flat areas in the eastern parts of Suffolk County on Long Island.
The Cornell Link:
Cornell University provides the leadership for the entire Cooperative Extension system throughout New York state, yet it is a highly decentralized system. Cornell University establishes the program guidelines which the county offices carry out based on their local needs. McGonigal said, "Local control kept the organization viable for the last 75 to 80 years."

Each county extension association elects its own board of directors, hires its own staff and receives and manages its own funds. Cornell University influences the amount of state and federal funds that a particular county receives, but each association is completely responsible for acquiring funds from county legislators.

Cornell University's extension administration unit which sets the general administrative and personnel policies is headed by Director Lucinda A. Noble '54. More than 150 faculty in the Colleges of Human Ecology and Agriculture and Life Sciences are responsible for program development used across the state. In the College of Agriculture and Life Sciences, the departments of animal science, agricultural economics and soil, crops and atmospheric sciences are very involved in extension work. In addition, many departments in the College of Human Ecology devote research to the extension service. DeMarco stated, "This research base is crucial in the delivery of extension programs on the local level."

Funding for Extension Services:
Cornell Cooperative Extension receives funds from federal, state and county sources. According to McGonigal the federal funds remained fairly stable, but budget cuts have occurred on the state and local level. "The biggest impact on the number of extension positions has been by attrition. When an extension agent retired, no one was hired to fill that position," said McGonigal. However, the effect of budget cuts at the county level varies since it depends on the financial situation of a particular locale.

There was a 30 percent reduction in funds allocated to the Suffolk County association between 1988 and 1991. "It's not the 1980s anymore; money is tight everywhere," stated DeMarco. The Suffolk staff relies on grants, contracts and fees to combat these cuts.

In some cases, a program which the state usually funded was financed on the local level because the state lacked adequate funds. McGonigal predicted that the extension system will depend more on grants and contracts from a range of agencies and organizations as governments face greater economic difficulties. However, she also emphasized that extension would first determine the issues and programs, and then search for appropriate sponsors.

Future Trends:
McGonigal emphasized the need for extension agents to communicate closely with the faculty at Cornell. The extension agents serve as "reality checkers" to see which extension programs are needed and how well they work. In addition, she mentioned the critical need for departments within a university to work together. Many of the broad issues which face people today require a multi-disciplinary solution. According to McGonigal, departments are increasing their collaboration on mutual goals.

The cooperative extension system will continue to face new issues as they arise. McGonigal gave the environmental movement as an example, "Five years ago, there was little emphasis on the environment, now it has evolved into a very important issue." She added that, "Extension will continue to reflect what society sees as its major needs." DeMarco held a similar view of the services of the Suffolk County Extension office. "We will need to tailor the programs to the modern needs of our county residents."
More Grape News

The Lake Erie Regional Grape Industry Advisory Committee will include fifteen grape industry representatives from New York and Pennsylvania. The committee was formed as part of an agreement between Cornell University and Pennsylvania State University to combine grape research and extension programs.

“The advisory committee’s goal is to help guide the efficient delivery of extension programming for growers, while suggesting ways that needed research information can be integrated into growing practices,” said committee chair Doug Moorhead of Moorhead Vineyards, North East, Pennsylvania.

Moorhead went on to say that to remain competitive with growers in other regions of the United States and the world, Lake Erie area producers must be willing to invest in an aggressive research and extension effort. “We need to find ways to add value to our product, increase yields, and cut production costs.”

Rural Education

Members of the Department of Education represented New York at the 1992 National Congress on Rural Education. Richard E. Ripple, Professor of Educational Psychology and Dalva Hedlund, Associate Professor of Counseling Psychology, were nominated by a state committee and selected by the National Rural Education Association. The 500-member Congress consisted of rural civic, education, business and legislative leaders from the United States. The Congress which convened in Traverse City, Michigan, addressed issues and concerns related to the advancement of educational excellence in rural communities and worked toward the formulation of solutions that could impact national policy as well as state and federal legislation.

Wild Apples

Cornell, the U.S. Department of Agriculture and scientists from the state of Kazakhstan are seeking to collaborate on a joint expedition to the remote Dzungarian Alps in search of wild apples.

Herb Aldwinckle, Professor of Plant Pathology at the Geneva Agricultural Experiment Station, helped facilitate this collaboration when he visited Kazakhstan in 1989.

“The purpose of our visit was to explore some of the wild populations of apples growing in the mountains of Kazakhstan and neighboring regions,” Aldwinckle said.

Aldwinckle was searching for wild apples because they often contain genes for disease resistance or other useful traits that can be incorporated into commercial apples. He returned with 10,000 seeds for the national apple repository at Geneva.

Previously, the Dzungarian Alps which lie in both Kazakhstan and China were inaccessible because of the unwillingness of Chinese authorities to grant entry permission.

Graduate Students Honored

Graduate students in the Section of Ecology and Systematics were recently honored. Ulrich G. Mueller and Manon R. Preest were presented with the Robert H. Whittaker Award for the best oral presentation. Honorable mention went to Scott R. Smedley. The LaMont C. Cole Award for most outstanding paper went to Benjamin B. Normark. A College of Agriculture and Life Sciences Outstanding Teaching Assistant Award was awarded to Rob Roy Ramey.

Awards of Excellence

Peter J. Van Soest, Professor of Animal Science, has been presented with the 1992 International Dairy Production award. Van Soest’s work in developing the detergent system of fiber analysis which is used worldwide earned him this recognition. His techniques have been adapted to almost fifty species of animals.

Robert H. Foote, the Jacob Gould Schurman Professor of Animal Science, was honored with a symposium in which all eleven speakers were former graduate students of his. Foote taught one of Cornell’s most popular courses, “Animal Reproduction,” for over four decades. He will retire next year and an endowed lectureship will be established in his name to allow outstanding reproductive biologists to present lectures at the annual meeting of a professional society.

The Chicago Board of Trade Educational Research Foundation presented William G. Tomek, Chairman of the Department of Agricultural Economics, with the Earle M. Combs Jr. Award. The award was given in recognition of significant contributions to knowledge of futures and trading options markets.

Decker Named to Research Position

Daniel Decker ’74, MS ’76, PhD ’86 has been appointed associate director for research in the College of Agriculture and Life Sciences. His research has been in the area of human attitudinal and behavioral aspects of wildlife management. The author of 60 journal articles, 25 book chapters and more than 200 other research and extension publications, Decker has edited two books and been given numerous awards.
About the Issue

This issue of the Countryman focuses on environmental issues on the Cornell campus. We examine the people responsible for keeping Cornell such a beautiful home, we take a closer look at green issues in big cities and we expose current student attitudes about the whole environmental movement.

Correction:

The November 1992 Countryman article, “The Quincentenary: Cause for Celebration?” contained incorrect information. The correction is as follows:

Karen Medville, a Cherokee Indian physiologist and graduate student in environmental toxicology shared her opinion on the quincentenary. If there is anything positive that can come from reflecting on the past 500 years it will be because of educating others about Native Americans and the issues and challenges we continue to face on a daily basis. Medville added that, “I would like to see everyone have a greater respect for Native peoples’ wisdom and counsel. I believe that this is a key issue. Not only are the concerns of our communities rarely listened to or appropriately addressed, but additionally our intelligence and perceptions on how to solve problems and issues are never acknowledged. It is my hope that through education we will be able to increase the level of respect for the wisdom and knowledge that exists within Native American culture, as well as respect for The People.”

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MULCH TO DO ABOUT PLOWING, PLANTING, AND PRUNING

CAN YOU REMEMBER CORNELL UNIVERSITY closing due to inclement weather? Probably not, thanks to the University’s grounds crew.

“I’ve been in this position for eight years and we’ve never closed the University for an entire day yet,” said Dennis Osika ’64, Superintendent of Grounds. Snow, Osika explained, is one of the greatest challenges.

Cornell spends approximately $250,000 a year on snow removal. De-icing chemicals, labor and equipment, and overtime are the major expenses.

From a labor standpoint, working out in the cold has its disadvantages. After spending 10 to 14 hours a day in wet snow, the crew is anxious for winter’s end, but takes pride in its work. “If you drive through surrounding jurisdictions, our roads are the first being cleared,” Osika said. “We’re proud of that.”

Once winter ends, the grounds crew gears up for the new season. “Spring clean up is a fury of activity,” Osika stated. Osika’s crew must dig up dead flower bulbs and plant summer flower beds. Before the mowing season, grit—which accumulates along walkways during the winter months—must be removed. Winter damage to underground utility walkways and landscaping is repaired. Leaves are removed from window-wells and drains. “A single plug-up can ruin or damage a library or underground mechanical room,” Osika explained.

Moreover, pruning the campus-wide Boston ivy and Virginia creeper is expensive. These vines have a detrimental effect on gutters and roofs. Raccoons and skunks, Osika added, sometimes climb the vines on the buildings. For aesthetics and tradition, ivy remains on the older buildings on campus. “Some people prefer the privacy ivy affords and ask us not to prune it,” Osika said.

Prior to graduation day, over 100 acres of trees and shrub areas are mulched. Labor and equipment cost nearly $25,000 for each time the crew mows and trims the campus. “Mowing eats up 50 percent of our operating budget as it is very labor intensive. It also entails high equipment and fuel costs,” Osika explained.

The grounds crew prunes the ivy.

The Grounds Department works closely with the College of Agriculture and Life Sciences. Faculty experts in integrated pest management, floriculture, agricultural engineering and agronomy have been helpful in providing technical recommendations which support the University’s environmental goals. “I like working in the University setting as we have the advantage of accurate technical information,” Osika said.

Since Osika joined the Grounds Department eight years ago, his increased mechanization, upgraded facilities and equipment, and improved departmental human resources. Almost one-third of the crew has at least an associate’s degree. Some have undergraduate degrees from Cornell as well. Osika said, “I tell my crew ‘think while you work.’ It’s both a mind and body effort.”

Pride and loyalty play a big part in the commitment of the grounds crew. “Our people are our most valuable and rewarding resource,” Osika said. “They make all the difference in the outcome.”

“I’m in the service business,” he continued, “to shepherd the environment, improve our surroundings and give service to our campus community.” For

The grounds crew clears 20 miles of sidewalks, 50-60 times annually.

Osika, the number one goal is exceeding customer expectation. “Anyone who calls us is entitled to an explanation. Our goal is to treat each person with care and respect,” he said.

Trust, integrity, vision and perseverance, Osika noted, are the most important characteristics of a leader. “The challenge is being good enough to deserve that responsibility,” Osika concluded. By the looks of Cornell’s campus, he’s earned that respect.

by Lauren Oelkers ’94
City Dwellers
A New Look at Urban Trees

When most people think of big cities such as New York, Boston or Chicago, they think of cars, tall buildings, and crowded streets. When Nina Bassuk '74, Associate Professor in the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences, thinks of urban areas she thinks of the trees.

Bassuk is the program leader of the Urban Horticulture Institute at Cornell University. "Where pavement exists, you have urban horticulture," Bassuk explained. In October 1992, she was presented with the Urban Beautification Award from the American Horticultural Society. The award recognized the institute's research efforts and work in the area of urban horticulture. "It was the first institute set up to take a scientific look at plants in urban areas," said Bassuk.

The Institute's purpose is to study how plants interact with the urban habitat in order to discover better ways to improve plant growth. "The major focus of our work is street trees and trees in larger public greenspaces," she added.

Bassuk also works closely with Dan Schmohe, City Forester and Supervisor of Parks and Forestry in the City of Ithaca. Together, they have written zoning ordinances that affect trees in the city, and worked with citizens in extension programs.

According to Schmohe, the City of Ithaca has approximately 80 miles of city streets and 5,000 trees. "Fifty-five per cent of all the trees in the City of Ithaca are maple of one variety or another," he added. Ideally said Bassuk, no one tree variety should make up more than five to ten per cent of a total tree population. Monoculture or the planting of one variety is dangerous because it creates a huge food source for various tree diseases and insects.

TREES AND URBAN ENVIRONMENTS

Most people do not realize how vital trees are in making an environment inhabitable. "Trees have function, they're not just aesthetic niceties we can do without," said Bassuk. Trees provide shade, help purify the air and can hide unsightly views. By providing shade and a wind barrier, trees can cut down heating or cooling costs. Trees also provide a habitat for birds, that would otherwise be missing in a city environment.

According to Bassuk, the average life of a downtown or city tree surrounded by concrete on all sides is approximately 7-10 years. For a tree with a parallel strip of grass alongside it, the average life span is 30 years. These statistics are disturbing when contrasted with the average life span of a tree in a rural setting. Trees in their natural environments can live up to 80-150 years.

ENVIRONMENTAL STRESSES

Various reasons exist for the short lifespan of urban trees. Most trees are under some sort of stress from the surrounding environment. Trees require six basic needs: water, nutrients, light, oxygen, carbon dioxide and proper temperature. "When a tree is not getting its basic needs met, a tree is under stress," explained Bassuk.

City streets are not designed for a tree's growth and do not provide a nurturing environment. The construction of roads and sidewalks require the compacting of soil which leads to less oxygen in the soil and poor water drainage. "It basically displaces the oxygen around the root system," said Bassuk. When the tree's roots are immersed in water, the roots essentially drown from lack of oxygen. Along with compacted soil, foundations, drains and utilities are also located below the street, leaving little room for root growth. "It's putting plants in as an afterthought to those infrastructures that causes the problems," said Bassuk.
Urban budgets, municipal budgets, being what they are, we put our efforts into the plant establishment phase.

Since most urban trees receive little care once they are planted, it is critical that proper planning takes place. "Municipal budgets being what they are, we need to put our efforts into the plant establishment phase," said Bassuk.

The first phase in planning for trees is site assessment below and above the pavement. It is critical to consider what type of tree is going to survive best in those conditions. The second step is proper plant selection because certain trees survive better in certain adverse conditions. Accommodating the tree, through site modification, is the next step. Finally, the proper transplanting of the tree is the last step to insure the best chance for survival.

Transplanting is a critical step since up to 90 percent of a tree’s roots are cut off before transplanting. "A tree goes through a period called transplant shock for approximately three years before it is back and growing," said Bassuk. During this time, it is critical to insure water uptake and encourage new root growth. Currently, the Institute is working to shorten the period of transplant shock.

URBAN PLANNING

Bassuk’s work at the Institute has influenced the city government to look at city forestry and urban planning in a new light. According to Schmohe, the budgeting for urban horticulture in the City of Ithaca has increased from $7,000 in 1987 to $18,000 in 1992. "We’ve had some change in the way people look at trees," said Schmohe.

During the reconstruction of Hudson Street located in downtown Ithaca, Schmohe and Bassuk worked closely with citizens in tree planning. "We visited with each and every homeowner and discussed whether a tree could go in a particular spot or not," he said. Homeowners also picked out a tree variety from an approved list. "It’s been very successful—it’s changed the way the city approaches a major reconstruction like that," he added. However, even with the increase in funds, the city has not been able to maintain the present number of trees in Ithaca. Part of the problem is vandalism.

"The population as a whole respects trees highly," said Schmohe. "The problem with vandalism has been in the area of Collegetown and the area below Ithaca College," he explained. "Up in Collegetown, particularly on Dryden Road," said Schmohe, "any tree that’s branched under seven feet gets those branches basically ripped off," he added.

Most of the vandalism is not malicious, according to Schmohe. Some people just do not realize the fragile state the trees are in.

In order to increase awareness about the importance of trees, Bassuk and Schmohe worked closely with a group called Citizen Pruners, who help take care of the city’s trees. A pilot program called Ithaca Tree Works is being developed for this spring. Volunteers will plant trees and will be responsible for taking care of the trees in a designated area. Bassuk hopes that fifty trees will be planted through this program.

Urban trees are a vital part of making a city environment more habitable. Bassuk’s work will ensure that urban trees receive the attention and care necessary for their survival.

by Ann Chi Lau ’93
SPECTACULAR GORGES FORM AS THE waters of Cascadilla and Fall Creeks carve their way down through the rocks beneath Cornell's campus. The creeks began cutting today's gorges roughly 15,000 years ago, as the waterfalls sculpted their way uphill, again, and haven't stopped. These are not the first gorges to be here, only the most recent, for the history of the gorges stretches back nearly half a billion years to a time when the land Cornell sits on was at the bottom of an ancient ocean. Mud from ancient landforms washed into the sea and settled in layers on the sea bottom, eventually forming the shale layers that make up the gorge walls and the bedrock upon which the Cornell campus sits.

John Chiment, an editor with the Cornell Mathematical Sciences Institute, is a paleontologist who was drawn to Ithaca because embedded in the layers of shale under Ithaca are some of the richest pre-dinosaur fossil beds to be found anywhere on earth. These fossils are also used to date the age of the shale layers, and the story that Chiment recounted is an ancient one. A walk down into the gorges is a walk back into geological time: The deeper layers are progressively older. How old? Said Chiment, "The rocks at the bottom of Cascadilla and Ithaca gorges may be one million years older than those at the top." A million years, though, is only the beginning: The shale extends approximately half a mile further down.

"The basic story that we piece together is that this area was covered by an ancient shallow sea about 300 to 400 million years ago," said Chiment. "The sea occasionally dried up leaving layers of salt, it re-flooded leaving more layers of shale. Eventually it completely dried up. This area was then raised slightly above sea level, about 200 million years ago during the age of the dinosaurs, so we were no longer accumulating any rock, were no longer burying any fossils. Instead we've been slowly eroding away ever since, filling in the new hole that's now formed over in the Atlantic basin. We don't know how much accumulated at one time above our heads, and has now been eroded away."

About 200 million years ago, as Chiment continued the story, "There seems to be some indication that there were some drainages of rivers in this part of New York that were flowing south, and those drainages during the time of the dinosaurs and since the time of the dinosaurs have steadily drained things away to the south. That's sort of how life was until about one million years ago, when the glaciers started to accumulate in central Canada."

Ice, up to two miles thick, under pressure, started flowing down the river valleys, pushing a lot of debris in front of it. "At that time there was just a little river down here in a gentle valley, the Cayuga River, flowing south," as Chiment related the story, "and the glacier comes in and fills this whole valley and under the weight of this the rock is all chunked up and we go from a gentle valley to a much..."
The upper set of falls in Cascadilla Creek gorge.

deep valley. The ice then melts away. There are still creeks that come into this valley, creeks that used to flow into this little river. All of a sudden they're flowing into this much deeper basin. These little creeks now have a lot more power because they are going down a much greater drop, and so they start carving back the rock, cutting gorges back into the sides of the valley.

"These gorges are formed," said Chiment, speaking of a time 100,000 years ago, "and a second glacier comes down from Canada, pushing a big pile of rock rubble in front of it again and completely fills these gorges in, so that you can't even see them today. They're there, but they're buried. Then the glacier melts back and the same little creeks start flowing again, but as chance would have it, in most cases they don't flow in exactly the same spot, and so they start digging another gorge. Those are the gorges that we see today."

This is not the whole story, and does not fully explain what we see in the gorges today, and Chiment resumed, "So we have this buried set of gorges that are maybe 100,000 years old, and we have these modern gorges that are maybe 15,000 years old, and there are a few places where those two gorges intersect. When the creek is digging through this ancient shale, hard rock, it makes waterfalls, steep-sided gorges, but when the creek happens to intersect the buried gorge, which is only filled with sand and gravel, it doesn't have that problem and it makes a big bowl: That's what Beebe Lake is. Beebe Lake is where the two gorge systems intersect."

"There are very few places on the shores of Beebe Lake that you can see hard rock," said Chiment. What you see is gentle smooth shores, but there are few cliffs there right on the lake.

"There are a few places where the two gorge systems never intersect," Chiment recounts, "like Taughannock Falls. That's why the modern gorge at Taughannock Falls has one big 200 foot drop because the ancient gorge is still buried off in the woods, whereas almost all the other state parks in the Finger Lakes have falls above, then a big swampy spot where the gorges are intersecting, and then another set of waterfalls down below. You see the same thing over in Fall Creek, where you've got the falls in Forest Home and the Ithaca Falls down below and you've got Beebe Lake in between."

Why are the sides of the gorges vertically fractured, and why do the rocks in the gorges break into perfect rectangles? Again, Chiment knew the answer. "The fractures are not a feature of the gorges, they are a feature of the shale. There are cracks that develop in the shale and propagate upward. If you look at a big map of New York, and you look for those cracks (and people do this) and you plot them, it turns out that there are actually two series of cracks. They radiate out from two points north of Ithaca, and it turns out that right in this area, in Ithaca, the two sets of cracks intersect at 90 degrees, but in most other places they don't, so they're not so dramatic. Right here in Ithaca the shale breaks into rectangles. Aha! Another vexing gorge mystery revealed!"

On the surface of those perfectly rectangular slabs one can often see the ripples of the ancient muddy sea bottom, and find fossils from before the age of the dinosaurs. With every torrential spring thaws the creeks carve their record into these gorges as they have for the past 100,000 years.

Presently, the responsibility for Cornell's gorges rests with the University. "Everybody at Cornell feels that the gorges should be preserved; they are one of the significant features of the campus. Everybody who comes here and goes away remembers the gorges, if nothing else," said Peter Marks, chair of the Natural Areas Committee of the Cornell Plantations, which oversees all of Cornell's natural areas, including the gorges. Marks said that it is the policy of the Natural Areas Committee, and of Cornell's Board of Trustees, to preserve and maintain the gorges. "The big issue here is preservation," he said, "How do you allow on the one hand for flexibility and growth, while on the other hand keeping these gorges intact and preserved? It's an ongoing process."

Under Cornell's stewardship the gorge environments should remain in their present natural state. Cascadilla and Fall Creeks will continue carving the shale until a third ice age comes and covers them up again, and geological history repeats itself once more. ■

by Richard Ginn '94
THE DRAMATIC POLITICAL CHANGES in the former Soviet Union have undoubtedly produced tremendous benefits for the Russian people. However, their transition toward a democratic state is tremendously difficult, and numerous problems have evolved as well. A major concern, particularly for urban residents, involves the decrease in the overall availability of food. Small plots and gardens account for 25 percent of all food grown in the former Soviet Union; yet, gardening is not commonly practiced in the cities. An urban gardening program could be a partial solution to hunger in St. Petersburg and Moscow.

In September 1992 a group of Cornell faculty and other professionals from the United States travelled overseas to the former Soviet Union. The group focused primarily on urban gardening in St. Petersburg and Moscow, as a means to provide a more reliable source of fruits and vegetables to inner city residents. The trip was organized by the Center for Citizen Initiatives, which promotes the non-profit exchange of ideas between citizens in the United States and the former Soviet Union.

Cornell University granted leave time to the faculty members involved. Bob Kozlowski ’65, a Senior Extension Associate in the Department of Floriculture and Ornamental Horticulture, and Marcia Eames-Sheavly ’83, an Extension Support Specialist in the Department of Fruit and Vegetable Crops, introduced the “Master Gardener” and “Radishes to Riches-A Produce Marketing Project for Youth” programs, respectively. Dr. W. Keith Kennedy, Professor Emeritus of Agronomy at Cornell, also accompanied the group. He was particularly interested in learning more about the soils on which inner city gardens might be established.

The people in the former Soviet Union were generally enthusiastic about the programs and the suggestions from the agricultural delegation. Eames-Sheavly said, “The people were so receptive that it was almost overwhelming. They seemed hungry for any printed information about topics ranging from basic gardening to the marketing of crops.” In St. Petersburg and Moscow, 21 teachers will introduce the “Radishes to Riches” program within the year.

The inefficiency of the state-funded agricultural system in the former Soviet Union reflects problems within the political structure as a whole. “The political system faces numerous difficulties because it does not have the people’s trust,” said Kozlowski. Since the fall of communism, inflation has risen dramatically while the average salary has remained relatively static. This has produced a tremendous economic impact throughout all aspects of society. According to Eames-Sheavly, most families appeared to lack many consumer products found in most U.S. households, such as detergent, diverse food products and appliances.

The poor economic conditions in the Commonwealth of Independent States also hinder agricultural production, particularly in the distribution of produce. The increase in fuel prices and in vehicle maintenance has led to extremely costly transportation and food storage. Although collective farms produced the same quantity of crops this year as in 1991, less food will reach the people since the government cannot distribute it effectively. Not surprisingly, people’s faith in communal farms has eroded. Currently an expansive black market distribution system exists for a wide variety of goods. This

A dacha outside St. Petersburg uses all available land to grow food for the family that runs it.
black market contrasts markedly with the state-run stores, which generally sell only one type of produce. Kozlowski said, "A state store would have 50 people lined up to buy bread, simply because it was the only place to get it. The people would then have to go to different stores to get meat, vegetables or fruit." Both Eames-Sheavly and Kozlowski commented on the tremendous amount of time and energy that people devote to obtaining their basic food items.

To decrease their dependence on products from the communal farms, people often grow fruits and vegetables in dachas. Dachas are small plots of land usually shared by an extended family, used for small scale farming. Eames-Sheavly said that these dachas are 15 times more productive than the farms controlled by the state. People frequently plant potatoes on the dacha since they can grow without daily care, in poorer soil and can be stored for a long period of time. However, people grow other crops as well, such as carrots, beets and onions. In addition, people frequently grow tender crops, such as tomatoes and cucumbers, under makeshift plastic greenhouses, which shelter the plants from the cold of a short growing season.

In the past, dachas were primarily reserved for high ranking members of the Communist Party. However, Boris Yeltsin, the Russian president, recently made dachas more accessible to the populace. The commute to some of them, however, can be quite lengthy. Kozlowski said, "Some of the older dachas are relatively close to the city—45 minutes away—while others can be a four to five hour train ride outside the city." A popular sentiment that crops will not grow in the cities contributes to the widespread use of dachas. The belief that the urban environment is contaminated has a rational basis since some urban areas were used for dump sites. Kozlowski sees a definite need to determine the extent of this pollution, "Space for gardening in the inner city is not the limiting factor. The difficulty is finding objective information about possible pollution and soil contamination problems."

In order to cope with a variety of hostile environments, people adopt a very pragmatic approach to gardening. "Fertilizers, lime or pesticides are not readily available to home gardeners," said Kozlowski, "so they rely on organic techniques." For example, people inter-

plant strawberry and garlic crops in an attempt to discourage insect pests.

The willingness to experiment allowed for an enthusiastic exchange of ideas between the Americans and their hosts from Russia. Eames-Sheavly focused on marketing projects for youth leaders and teachers in order to expose them to price strategies, competition and other economic issues. Her "Radishes to Riches" project combines a variety of skills, ranging from money management and business techniques to plant pathology and entomology. This program was originally intended for youths but attracted a large number of adults as well.

The people were slightly less receptive to the "Master Gardener" program than they were to "Radishes to Riches." Kozlowski stated, "The Master Gardener program may take a bit longer to catch on. Though most Russian gardeners were very open and outgoing in the confines of their homes and gardens, they are still hesitant about sharing information and ideas in their communities." He believes that, under the communist system, people were forced to "share" as a "commune" and now they seem to instinctively resist communal endeavors.

Eames-Sheavly predicted that the Center for Citizen Initiatives will increase agricultural programs at the grass roots level. The mayor of the Moscovsky District in St. Petersburg has already agreed to reserve areas of the city for urban agricultural programs. According to Eames-Sheavly, "Two rooftops and four pieces of property would be designated as demonstration gardens."

Another way to improve the future of urban agriculture in the Commonwealth of Independent States lies in the establishment of a common research base. Kozlowski pointed out that the United States maintains a strong horticultural research base through the land-grant system. In the former Soviet Union, the different disciplines of the agriculture research community are completely independent of one another. Their system lacks the cohesiveness of research institutions in the U.S., which inevitably hinders the sharing of knowledge between agricultural professionals and home gardeners. However, Kozlowski observed, "The interest in moving to a free market food production system is definitely there. We just need to help them recognize how production skills, technical knowledge and experience can be quickly and efficiently shared." Additionally, in order to meet the short term goals and to simply feed the people, Eames-Sheavly believes, "Increasing the number of people who are actively gardening will be beneficial, particularly in the cities."
DAN JONES USED TO HATE TO SHOP. However, last month he volunteered to do the week’s shopping. His wife’s jaw dropped. Jones drove to the local shopping plaza, bought the food on his list, deposited a paycheck that included his Christmas bonus, grabbed some lunch, got his holiday film developed, refilled a prescription, and rented some videos for his children to watch that evening. Errands like these usually drive people crazy, and take all day to complete. Jones, with a smile on his face, finished all his chores, without leaving his local supermarket.

Have you noticed what’s happened to supermarkets? Originally just a place to pick up the week’s groceries, supermarkets have evolved into an all-in-one store where groceries are just one of the many products and services available.

Like discount department stores and drug chains, supermarkets have been growing bigger and have evolved into what food retailers call super-supermarkets. Some occupy up to 70,000 square feet—almost two football fields! As they grow larger, supermarkets are incorporating more product lines into their merchandising mix to keep people coming to their stores.

By the year 2000, American consumers can expect to see supermarkets growing even larger and shifting their emphasis from primarily dry groceries to fresh foods, including brand-name produce, deli salads and seafood. Shoppers are looking to purchase ready-to-serve items, take-out food that only requires reheating, and higher quality foods. This creates a challenge for supermarket managers who want to attract shoppers to their stores.


McLaughlin reported at the December 1991 Cornell Agribusiness Situation and Outlook Conference that food industry executives expect sales in produce, deli, bakery and seafood to expand, doubling or even tripling from current levels through the end of the decade. Furthermore, he said, “The trend toward brand-name fruits and vegetables in particular offers local produce suppliers an exciting opportunity to develop brand names and differentiate their product from others.”

A Cornell News Service press release about the conference reported, “As consumers become increasingly health-conscious, the expanded fresh food departments are expected to be at the expense of shrinking meat and dairy sales. The new items will be complemented by specialty mini-shops with services such as ready-to-eat fruits and vegetables and custom-cut cheeses and meats.”

The 1991 study, conducted by McLaughlin and research support specialist David Russo, found that compared to 25 years ago, take-out food sales are expected to triple, accounting for 15 percent of supermarket sales in 2000. Also, consumers can expect many more items to be introduced to the market. In 1990, more than 13,000 new products became available, and these numbers are expected to increase at least through 1995.

Virtually all fresh foods sold in supermarkets will experience a strong growth in sales through the end of the decade. This growth is expected to come at the expense of non-perishable food sales, as these products are now commonly sold in stores other than supermarkets.

Supermarkets are responding to these changes by redesigning and expanding their buildings and floor space, catering to the emphasis on perishable items. The
January 1992 issue of Progressive Grocer reported that the Giant Eagle supermarket in Latrobe, Pennsylvania colorfully decorates the beginning of the traffic pattern in the store, which houses the deli, florals and produce departments. It pointed out the several types of lighting, including spotlights over produce. Awnings, hanging lamps and a tiled backs wall accented the deli department, and floral, seafood and meat departments were highlighted by handmade, sandblasted wooden signs. Latrobe Giant Eagle owner Jack Bache explained that his store is striving for a quality perishables image, acknowledging that these departments account for a high percentage of his total sales.

Supermarket owners like Bache used to be most concerned with the price-sensitive shopper. Now, they also have to contend with bigger drug stores, all-purpose stores like K-Mart, Walmart and Woolworth's, as well as the new wholesale club stores, which sell groceries and traditional supermarket non-edibles. These stores force grocery owners to make their prices more competitive, often losing money on some products to keep consumers coming to their stores.

McLaughlin's 1992 report defines "wholesale clubs" (also known as 'warehouse clubs' and 'membership clubs') as a retail store that limits access to businesses and individuals who become members of the club. Small business operators are attracted to wholesale clubs for the economy and convenience of the clubs' "cash and carry" nature, enabling the consumers to get the products and quantities they want.

Wholesale clubs have not received the same response across the country. McLaughlin’s study concentrated in New York and New Jersey, and although most shoppers are pleased with the clubs' arrival, a minority of shoppers there explained that they don't join the clubs because they dislike large package sizes and the annual membership fees. However, these shoppers said that the club stores give a better value for general merchandise, health and beauty aids and dry grocery items. That worries grocers.

In response, supermarkets are developing "club store" sections that mimic the layout of club stores. Other supermarket owners are opening their own versions of club stores. Many supermarkets have bulk food items, and package their items in different sizes, also keeping full, unpacked cases on their shelves.

Supermarkets also routinely use frequent shopper programs and database software to track purchase patterns and demographic data on consumers and allow them to launch "micro-marketing" programs for particular products to specific customer segments. Progressive Grocer reports that retailers in unusual locations use inventive merchandising, decor changes and added customer services to spark sales and increase traffic.

Supermarkets once only sold food. Now, all the week's errands can be completed in one store. Will people appreciate the accommodations supermarkets are making, or will they segment their shopping by purchasing non-perishable items at wholesale clubs and mass merchandise outlets? Dan Jones probably will continue going to his supermarket, but others might discontinue shopping at supermarkets altogether. One fact is indisputable: supermarkets in the 21st century will not be the same.

by Jennifer Rabin '94

Shoppers can choose different kinds of coffee beans and mix their own blends at supermarkets, which commonly offer free samples to entice customers.
LIBRARY SLOPE, THE ARTS QUAD, THE gorges and the clock tower pressed against the sky are images that, to many, symbolize the Cornell experience. Construction vehicles and gapping holes in the ground are also sights familiar to most Cornellians.

In just the past decade, close to two million square feet of new space were added to Cornell's campus. Yet during this same period, Cornell's characteristic open spaces and long views were preserved by the campus planning process.

According to Lewis Roscoe, Director of Campus Planning, planning the University campus is a complex process that creates solutions to satisfy the needs of all parties affected by a proposed project. Thus, the Board of Trustees considers not only Cornell's expanding physical needs, but also the potential visual impact of structures, before approving any construction project. Lilyan Affinito '53, Emeritus Chairperson of the Building and Properties Committee, wrote in the 1990 Cornell Campus Plan that the planning process "enables us to provide for program improvements within a framework that preserves the best qualities of our campus environment." The Board's own policies and the policies and expertise of faculty and staff members create the framework in which planning decisions are made.

Adopted by the Board in 1972, the Basic Principles of Planning and Design define the guiding objectives of the process. The University updated the 1972 principles in its Campus Plan of 1990 which included policies for physical evaluation of the campus. These objectives include maintenance of the University as a coherent whole, preservation of outdoor spaces and views and protection of designated special areas and buildings. "It's our job to make Cornell a unified attractive campus," said Roscoe.

Documents prepared by special University committees identify specific properties that should be preserved. For example, the Special Areas Report provides a guideline followed by the University. This report, presented to the Board in 1990, identifies special buildings and areas on Cornell's campus. Among the buildings on the list are Iruris Library and Tower, Sage Chapel and the A.D. White Mansion. Special areas listed include the arts quadrangle, the gorges, Library Slope and Beebe Lake. With the list of special areas are the key natural areas, like the gorges, identified by the Natural Areas Committee. These natural areas were selected because they have particular natural vegetation that is potentially useful for teaching and research.

The Board's principles and the properties specified in the Special Areas Report are merely advisory guidelines. It is difficult, if not impossible, to anticipate the future needs of Cornell University. As a result, campus planning is intended to be a flexible process.

According to Nancy H. Goody, Campus Planner, the planning office "facilitates review of proposed design projects on campus." Goody refers to herself as a "professional advisor to the administration." Essentially, the Campus Planning Office guides the planning process, gathering the input from all the affected parties to develop a project's final design requirements.

The intended users of a proposed structure are only one of the many groups affected by any given project. Future users of a structure, other students, faculty and staff, Cornell's neighbors and
interest groups and specific parts of the University, like Cornell Plantations, may also be affected by proposed changes. For instance, Nancy Ostman, the Natural Areas Coordinator for Cornell Plantations, plays an advisory role in the development of plans for both the proposed Mann Library expansion and the Johnson Graduate School of Management expansion because those projects may affect the forested slopes along the north edge of these sites, important natural areas.

In order to identify and address the interests of different groups, project plans are reviewed by many parties and frequently changed in response to their comments. This makes campus planning a time-consuming process.

The focus of campus planning objectives on the preservation of campus views, campus coherence and special areas and buildings means that the functional needs of a project's intended users are only one of many factors considered during this review process. The impact a project will have on these environmental objectives is also an important consideration.

It took almost three years for the plans for Kroch Library to progress from concept stage to the final detailed plans. During this period, librarians, students and faculty who would eventually use Kroch Library were consulted on issues of location and function. It was determined, from this input, that the addition needed to be adjacent to Olin Library.

When other groups were consulted to determine the impact a building in this location would have on the open spaces and views of the arts quad, the decision was made to build Kroch Library underground. The benefit of preserving the open areas and views of the arts quad outweighed the additional costs.

Today, Kroch Library is a functional underground unit, the result of planning, compromise and creative solutions. Kroch Library is an example of successful planning. It is a new structure that meets not only the needs of its users but also preserves Cornell's characteristic open spaces for all to enjoy.

When asked to speculate about what Cornell will look like fifty years from now, Goody offered the following personal image.

The campus will be a little more dense around existing green spaces. For example, the underdeveloped areas along Tower Road may be sites for further development. Similarly, there will be sensitive additions to current buildings, continuing the trend exhibited with the Olin Library expansion.

"There is a strong sense of landscape here that makes the campus cohesive," said Goody. As a result, the campus will be more cohesive with better visual and political connections between its various buildings and spaces.

Historical buildings and spaces like Uris Library and Tower, Library Slope, the arts quad and Sage Chapel will remain, preserving the Cornell experience.

The class of 1993 has seen the completion of Roberts and Kennedy halls on the agriculture quad, the Theory Center on the engineering quad and Kroch Library on the arts quad. The class of 1993 has also experienced the open spaces and long views that mean Cornell. Given Goody's predictions, it seems that the class of 2043 will share a similar experience.

by Jacqueline K. Lurie '93
MAYBE LITTLE MISS MUFFET WAS onto something we don’t know. That curds and whey snack of hers wasn’t a bad idea. Two researchers in the Department of Food Science in the College of Agriculture and Life Sciences have found out some interesting things about whey.

Lance Phillips, PhD ’92, a postdoctoral researcher and Scott Hawks, a research support specialist, have found a method of making whey, the waste product of cheesemaking, into foam. From the foam, any number of products may be developed, from edible shaving cream to packing material. “We might even be able to make a fire fighting foam,” mused Phillips.

Each year, the cheese industry produces about 4.5 million tons of whey. The National Dairy Board funds research, including Phillips’ and Hawks’ project, on various ways whey can be used, rather than discarded.

“It costs a lot of money to get rid of whey,” said Hawks. Whey contains protein and milk sugars, and can’t just be dumped into water supplies. “Most big cheese plants have their own systems of disposal, like waste treatment plants or lagoons.” In a lagoon, air is pumped into the whey—“Just like a Jacuzzi,” said Hawks—and microbes digest the whey. Eventually, only clean water remains.

Today, half of the waste whey produced each year is used: one quarter goes to animal consumption and one quarter to human consumption. Powdered whey isolate is used in foods like salad dressings, infant formula and high protein diet shakes. But that still leaves over 2 million tons of whey to dispose of each year. There’s a lot of it, it’s inexpensive and with Phillips’ and Hawks’ foaming process, whey should prove useful in many industries.

In order to turn whey, the waste product, into whey, one of many products, Phillips and Hawks developed a foaming process that incorporates air and ethyl alcohol into the whey.

“Typically,” explained Phillips, “protein foams aren’t very good at carrying ethanol. One of the things we’ve done is to figure out a way to put ethanol in a foaming material, which makes it useful for alcoholic beverages and desserts.” The ethanol also gives the foam the ability to carry other things, like flavors or fragrances, so it can be used in a wide variety of products.

“The reason we talk about shaving cream,” said Phillips, “is because it shows people the duality of this product.” Whey foam can be used in the food industry in
breads, cakes and dessert toppings, to name a few. On the other hand, said Phillips, the foams can also be used in gels and foams, or as an alternative packing material.

Phillips' and Hawks' research benefits not only consumer products industries, but also biochemistry. By researching the unfolding properties of whey proteins, they are expanding the knowledge of protein properties in general. "My main interest is in protein chemistry," said Phillips. "It just so happens that we have an application for this."

From their research on protein chemistry, Phillips and Hawks have both learned new things about the science of proteins, and developed a patentable process. Cornell has filed a patent application for the foaming process, naming Phillips and Hawks as the inventors.

The researchers don't expect to get rich from the patent, but they enjoy their work nonetheless. "We understand things on the molecular level," said Phillips. "We look at a molecule's 3-D structure and how we can modify it. Once we understand that, we take the next step. In this case, that was finding a way to make the stuff carry air." Identifying practical applications is the last step.

They developed edible shaving cream in about a day, according to Hawks. They changed the formula little by little and tested the results on Hawks' face. Although he said his face hurt by the end of that day, he smiles when he talks about that day.

The idea of scientists shaving each other's faces with a cheese by-product may not strike the public as "normal." But, what better way to develop a product, argue Hawks and Phillips. "Most of the time we just enjoy what we do," said Phillips. "It's when people get all upset and serious . . . that you can't get anything done."

Along these lines, Phillips and Hawks agree about confusion in the scientific arena. "Often, scientists want this mystique. They want everybody to be so confused that the scientist looks real smart," said Phillips. "There's nothing worse in science than confusion."

These researchers don't like that "confuse 'em" philosophy. For example, when talking about the unfolded protein in whey, Phillips describes it as looking like a "frizzy hairdo." Hawks said some scientists are upset by that comment and say it is not a frizzy hairdo, but instead they use some long word. Said Hawks, "Come on! It's a perm!"

There is little glamour about Phillips' and Hawks' research, interesting and impressive as it is. Their equipment is a perfect example. The primary instrument in their foaming research: a kitchen mixer.

"You know," said Phillips, "we hate this thing. It's not sexy. And what's frustrating is the amount of interesting information we get out of it." While they would love to find some big, impressive, "sexy" machine, with flashing lights and knobs, the Sunbeam mixer does the job. In fact, the mixer gave them the same information about the structure of a protein as a piece of biochemist's machinery that costs $200,000!

Thanks to that mixer, we may all one day be shaving with edible products. Packing material may serve as a fine fertilizer for our lawns, because it will biodegrade into whey proteins when it rains. Phillips' and Hawks' work certainly stands to have a noticeable impact on the cheese industry and many related fields as well.

by Lesley J. Wright '93

From Milk to Cheese

The cheesemaking process differs some from kind to kind of cheese, but the basic idea is the same. In this country, most of the cheese consumed is cheddar cheese. The process used to produce cheddar cheese is a good example of cheesemaking.

First, cheesemakers heat milk up to 100 degrees Celsius, said Scott Hawks. Then they add some starter cultures. The cultures are bacteria that produce lactic acid, which lowers the pH level of the milk. The next thing added is a proteolytic enzyme that causes the milk to form a curd.

"Then they take that curd and cut it up into small cubes," said Hawks. "That's what most of the whey separates from the mass of curd. Then they stir it up for a while, before draining off this whey. All that's left is curd."

Now the curd is ready to go through the "cheddaring process." According to Hawks, "It's a period of time when they raise the temperature of the curd to 106 degrees. That causes some acid production and it actually causes the curd to mat together." At this point, it begins to look more like the cheese you recognize.

The producer then slices the cheese up and puts it into a mill to grind it into small pieces. Those pieces then go into containers called hoops—which can be any shape—and are pressed. The remaining whey is pressed out of the cheese at this point, and when the process is finished, you have a block of cheese.
THROWING IT ALL AWAY

AS THE BELL TOWER STRUCK 12 NOON, the crowds began to file into the Cornell dining facilities. Outside of Trillium, two friends met to share lunch and to catch up on the weekend's gossip. Among the delectable selections on each of their plates were a chef salad, a chocolate chip cookie and a bottle of Snapple diet iced tea. Lunchtime passed too quickly and soon the friends were off to classes. But wait, what did they do with their garbage? Did their recyclable Snapple bottles find their way to the recycling bin provided by Cornell? Recycling?

In another Cornell Dining establishment, a young man rushed in to grab some food before his next exam. Since he did not have time to sit down and enjoy his meal, he asked for the food "to go" and ate on the run. When he arrived at his exam with a pile of garbage in his hands he could locate only one trash can in which to dispose of his waste. The trash can was labeled "recyclables," but since the student had neither the time nor the patience to locate a more appropriate trash bin, he disposed of his trash in the recyclables can.

Are the students in these two scenarios acting out of the ordinary or are most students more concerned with convenience and comfort than with environmental issues? According to a study conducted by Larry Gigliotti, a research associate in the Department of Natural Resources, Cornell students are not ready to make personal sacrifices in order to benefit the environment. Gigliotti randomly surveyed 1,500 students to compare current attitudes about the environment with conclusions from similar studies done in 1971 and 1981. The study focused on what students were willing to give up by measuring changes in attitudes toward 35 specific items in five major categories: foodstuffs, household items, transportation, personal items and recreation. Gigliotti discovered that students today are less willing than students in 1971 and 1981 to make personal sacrifices. "The results are not really upsetting to me," he said, "although I would have hoped that students today would be more willing to give things up."

Students in 1991 were more willing to give up only six of the 35 items on the list including: an oven in the home, pre-wrapped fresh foods, frozen foods, motorcycles and beef steaks. Material items that students were unwilling to part with include telephones, clothes dryers, deodorants and canned soft drinks. Gigliotti noted that his study also measured materialism and environmental concerns as trade-offs. That is, he hypothesized that since the publication of his first study, increased technology has granted Americans a more materialistic way of life, a way of life in which people rarely worry about the impacts that their new-age stereo will have on the environment. Gigliotti further predicted that in order to achieve greater concern for the environment during times of increased material wealth, a message emphasizing the importance of other values such as family life, public interest concerns or self-fulfillment must be brought to the forefront of American concern. Similarly, an environmental message that focuses on how a clean environment can aid in the attainment of these other values needs to be formulated.

From his evidence, Gigliotti observed an interesting and crucial attitude change that reflected societal influences on individuals. Gigliotti singled out the willingness of students in 1991 to give up beef steaks as a major indication of the necessity for increased environmental education. Beef steaks, he said, were a favorite food item of students 20 years ago, but since then the health industry has been mandating reduced fat and protein intakes from red meat.
"... recycling and environmental concern has to be part of your heart. It must come from within or change will not last."

It certainly seems that change will likely result if a message is specific and clearly explains the consequences and benefits of individual actions as they relate to the individual, his report said. "Similar to the benefits from eliminating beef steaks from the diet, people need to see a personal benefit in helping the environment," Gigliotti said. For example, if people were fined stiffly for not complying with recycling laws, Gigliotti predicted that more people would recycle.

Education also needs to begin to teach the concept of recycling as the one and only option. "The United States lifestyle can't be continued far into the future," said Gigliotti. "We have to start planning now. We can't wait until we run out of resources."

Currently, Gigliotti is working in conjunction with the Department of Environmental Conservation on designing environmental education materials for elementary school students. So far, the curriculum for fourth graders has received favorable reception from both teachers and students in New York state.

"We have to make the environment a framework around which every curriculum is taught. We can't teach it as a separate topic. Our goal is to teach young students how to live within the environment," said Gigliotti.

On a more local level, environmental education efforts at Cornell quickly are becoming a top priority. Connie Fuess, the Director of the Ecology House, recognizes the importance of branching out and educating the Cornell campus about recycling. Fuess, with the help of 130 Ecology House members and the Cornell Greens, works closely with dormitory recycling efforts. "I think it's important for everyone to realize that recycling is something for all of us. You can't take a neutral stance nor can you choose to ignore it, for then you just become part of the problem," said Fuess.

Part of Fuess's attempts to organize recycling in the dorms includes the addition of the sign, "When in doubt, throw it out," above all recycling containers. "Some people want to recycle, but they simply don't have the knowledge," she said. "We're trying to teach these people that one pizza box will contaminate the entire newspaper box, so it's better to just get rid of it in the trash."

Julie Wieczkowski '94 resides in the Ecology House and is the chairperson for the committee on in-house education. Wieczkowski is responsible for contacting guest speakers who come to the house to lecture about environmental issues. Her decision to become a resident in the Ecology House centered around her interest in the environment and her desire to live in an environmentally friendly atmosphere. As for recycling, "I don't consider it a sacrifice," she said. "Recycling is something we have to do. There is no choice in my mind."

Unfortunately, not all Cornell students share Wieczkowski's environmentally conscious attitude. Whereas Wieczkowski will walk around with Coke cans and newspapers in her backpack until she finds an appropriate container, Allison Bobis '93 just doesn't see the point.

"Of course I know that this whole environmental thing is extremely important, but I guess you can call it laziness that I am not willing to search for the perfect garbage can. Also, I don't really see how I can make or break the environment," Bobis said.

Although an ideal environmentally sound college campus would consist of students who share Wieczkowski's concerns, Gigliotti's study discovered that Cornell students' views tend to mirror those of Bobis. Referring back to the sometimes missing Cornell recyclable and non-recyclable bins, Gigliotti faults the organizers of the campus movement, not the students, for the ineffectiveness of the program. "I think it's a lack of understanding of human nature," he said. "Sure, they understand that you must have recycling, but they have to make it easy for students. Keeping students' laziness in mind, they have to make those facilities more available and more accommodating."

Fuess agrees and she also believes that although society has come a long way with regard to recycling, the journey has just begun. Education must start at an early age and recycling must become an integral part of life. The older generation may be set in its ways, Gigliotti said, so the hope lies with the next generation.

"The environmental movement has to work beyond knowledge," said Fuess. "Here at Cornell we get a lot of cognitive knowledge, but recycling and environmental concern has to be a part of your heart. It must come from within or change will not last."

by Ali Oshinsky '93
Carl Gortzig:
Tending the Gardens

AT THE END OF CLASS, PROFESSOR Carl F. Gortzig '52 does not leave Plant Science 37 until he answers all of his students' questions. Watching him talk to students in his Introduction to Horticultural Science course, one can see why, when College of Agriculture and Life Sciences Dean David Call '54 asked Gortzig to be the new director of the Cornell Plantations, he accepted only on the condition that he could continue teaching.

"I have a very strong interest in undergraduate teaching," said Gortzig, a professor in the College of Agriculture and Life Sciences' Department of Floriculture and Ornamental Horticulture. "I think it is a high priority of the University."

Gortzig, who earned a Bachelor of Science degree in floriculture and ornamental horticulture, joined the Cornell faculty in 1965. He received the Master of Science and Doctor of Philosophy degrees from Michigan State University. After serving as an officer in the United States Army from 1952-1954, Gortzig briefly taught horticultural science and mathematics at a Buffalo high school. For most of the next ten years, he served as assistant, then associate, county agricultural agent in Erie County, New York, with responsibility for the commercial and consumer horticulture programs.

Effective January 1, 1993, Gortzig became director of the Cornell Plantations, the arboretum, botanical garden and natural areas of the University. He succeeded previous director James M. Affolter, who left Cornell to teach at the University of Georgia.

"Serving as director will be an enjoyable challenge," said Gortzig. "The Plantations is at a point where the collections are increasingly well developed. Former directors have done much to get funding for the specific gardens."

An $8.5 million fundraising campaign

In the winter, the grounds of the Cornell Plantations are used heavily by cross country skiers. Visitors also enjoy sleighing out by the arboretum.
for the Plantations will continue through 1995. "We are primarily funded by gifts from alumni and other donors," Gortzig reported. "The University and the ag college both provide support as well, and we also have a number of endowments. Annual giving is the primary source of money for operations, and collection development is supported by special gifts."

Gortzig is not a stranger to the operations of the Cornell Plantations. He served as acting director from 1989-1990, as Chair of the Cornell Plantations Committee (now the Advisory Board), a faculty advisory body, from 1980-1984, and continues as a member or consultant member of the group.

Gortzig has held many leadership positions at Cornell including chairman of his department from 1975-1988. He won the 1989 New York State Gold Medal of Horticulture given annually by the New York State Department of Agriculture and Markets and the New York State Nurserymen’s Foundation. In addition, Gortzig is president of the Cayuga Chamber Orchestra.

As Director of the Plantations, Gortzig hopes to increase undergraduates’ awareness of what the Plantations has to offer. "Essentially, the concept of the Plantations is to be an outdoor laboratory on campus," said Gortzig. "We’re lucky because many schools have their botanical gardens far from campus."

The Cornell Plantations, which has existed since the early part of the 20th century, was named by Liberty Hyde Bailey, who is widely considered to be the Father of North American Horticulture. "Bailey was once dean of the ag college, and was into every aspect of horticulture," said Gortzig. "He wrote on every subject, including two large encyclopedias of horticulture and agriculture."

"There is a famous picture of Bailey with all of the books he wrote. They equal two stacks each about 12 inches taller than Bailey who was about six feet tall."

When Gortzig was an undergraduate at Cornell, the Plantations were not as organized as they are today. "But, the collections were heavily used," said Gortzig, who visited the Plantations frequently to see the plant collections and to go hiking. Gortzig added that in the winter many people enjoy cross-country skiing through the Plantations.

"Bailey saw the Plantations as a large horseshoe embracing the campus," said Gortzig. "It would be managed for education, research and extension.

“Our purpose now is to involve undergraduates to a far greater extent,” Gortzig admitted. "Through classes, independent study and Plantations-sponsored programming, I hope the Plantations can actually reach out more into undergraduates’ lives."

One of the first projects Gortzig plans to undertake is the Cornell Plantations Path, which is a concept introduced by former director Affolter. It begins at Treman Triangle, which is at the end of Cascadilla Gorge. The path extends up the gorge, out and across horticultural and historic sites on campus to Beebe Lake, and finally through the Plantations and to the eastern end of the arboretum.

"By installing marker posts and signs with educational and interpretive material, this path will introduce students and visitors to the different aspects of the University, including the Plantations," said Gortzig.

"The Cornell Plantations isn’t just a park or a place to jog," noted Gortzig. "It’s a collection of plants scientifically assembled to provide a teaching resource and environment. It also contains geologic and other natural history resources managed for educational purposes." The Plantations staff is currently exploring ways in which students can become more involved with the nearly 3000-acre area.

The Plantations, along with Sapsucker Woods and the Herbert F. Johnson Museum of Art, are three Cornell-sponsored units that are resources to the University for teaching, research and extension. "Alumni will come back to Cornell and sometimes discover these places for the first time," said Gortzig.

This semester, Gortzig teaches Horticultural Sales and Service Business Operations. He is excited to promote the Plantations to the Cornell community. "The resources are here," said Gortzig. "Our goal will be to ensure that faculty, staff and students are aware of its existence and exciting possibilities for providing enjoyable learning experiences."

by Jennifer Rabin '94
ON A MID-MAY AFTERNOON, YOU remove a Titlist white dimpled sphere from your bag. Next, after prickng your fingers on all the three-inch pencils you’ve amassed, you retrieve a two-inch tee. Finally, you yank a titanium-shafted driver from your bag.

After placing the ball on the tee and lining up in hitting position, you swing—club head whooshing as it glides through the air—and connect on a picture-perfect 200-yard drive. The ball is nestled in the middle of the lush fairway, creating a perfect lie for the next shot.

For most beginner and novice golfers who appropriately dub themselves “hackers,” the aforementioned is a dream sequence. However, when playing Cornell University’s Robert Trent Jones Golf Course, a praiseworthy shot is in fact rewarded by a favorable lie. This is a tribute to both Robert Trent Jones special ag ‘30, and Dick Deibert, Cornell University Golf Club superintendent.

With the intention of becoming a golf course designer, Jones literally created his own major in Cornell’s College of Agriculture. He took courses in such diverse areas as surveying, hydraulics, landscape architecture, horticulture, agronomy and communication. As reported in Good Sports, a chronicle of Cornell athletics written by the late director of athletics Robert J. Kane ‘36, Jones wanted to make a name for himself in golf architecture.

“He had personally designed two municipal courses,” Kane wrote, “but hoped that one for his alma mater might attract more attention.” Jones built a nine-hole course (now played as holes #10 through #18) between Pleasant Grove and Warren roads. The course opened in 1941 and cost a mere $43,000 as compared to today’s average price tag, as estimated by Deibert, of $250,000 for nine holes.

Jones, who was designing courses around the U.S., returned to Ithaca in the early 1950s and constructed an additional nine holes east of Warren Road (presently holes #1 through #9). In 1954, after spending a collective $173,000, Cornell possessed a magnificent 18-hole golf course.

“So many times, people change the terrain and make it into what they want,” Terry Mallett, an avid golfer and Cornell’s Director of Golf and Special Operations from 1988-91, explained. “Jones took what Mother Nature gave him and modified it.”

“He kept the land the way it was,” Deibert added, “using the natural terrain and keeping the existing topography.”

Mallett, who was an assistant football coach for the Big Red from 1971-88, expounded further on the course’s elegance. “One of Mr. Jones’s senior architects who had been with him for about 30 years, walked the course with me about five years ago,” he recalled. “When we got to the back nine, he was just totally amazed at how Mr. Jones had used the land.”

Credit for the course beauty, however, doesn’t belong solely to Jones. Deibert, who has maintained Cornell’s links since 1974, has received warranted accolades.

“Considering the amount of play the course gets from students and recreational golfers, it’s in outstanding shape,” said Pat Breen ’93. Breen is a four-year letterman for the Cornell golf team and has captured its Low Score award in each of the past two seasons. “The practice facilities are just as impressive,” he continued, referring to the driving range, practice sand trap and three putting greens.

“Through Deibert’s knowledge, ability and hard work, there’s no question that
we have the finest greens in central New York," Mallett boasted. "Everybody is envious of the kind of greens we have."

Furthering that envy is the fact that Deibert’s yearly maintenance budget (estimated between $285,000 and $300,000), as set by the Department of Athletics, is low when compared with private country clubs. "Mr. Jones has told me," Mallett continued, "that he couldn’t believe the job Deibert was doing on this course with the limited budget he has."

"I agree," Deibert gloated, deservedly, when asked to comment on Jones's remark. "I take special pride in the greens."

Aside from his greens, Deibert has undertaken numerous maintenance and beautification projects. Over the years, tree loss has been a problem. A large oak on the 11th hole, which was killed when struck by lightning, has been replaced. A pair of elm trees, on the eighth and 13th holes, killed by Dutch elm disease, has been replaced with combinations of oak, maple, mountain ash, evergreen, Scots pine, Douglas fir and spruce trees.

In addition, Deibert has planted perennial and annual flowers around the course and has replaced the conventional tee markers on the first hole with potted begonias. Deibert estimated that approximately nine percent of his budget is spent on beautification.

Most of the budgeted money is used for maintenance and staffing. Presently, Deibert is developing elongated and widened greens and tees for all holes. He has also been replanting two or three fairways per year, using a mixture of three perennial ryegrasses to replace the present Kentucky bluegrass.

These ryegrasses, already planted on fairways #1, #10 and #18, are particularly effective for the Cornell course. "Our selection was based on the fact that our irrigation is poor," Deibert said, alluding to the fact that fairway irrigation is nonexistent and those tees and greens which are serviced use antiquated 50- to 60-year-old galvanized piping. The ryegrasses tend to hold up in the heat, humidity, and drought conditions of the summer."

In the winter, according to Deibert, inclement weather threatens the greens. "Too much compacted snow and ice on a green kills the grass underneath in about 40 days," he noted. "We have to go out there and chop it up very carefully so we don’t damage the green." In addition, Deibert’s maintenance staff must sharpen the blades on the grass mowers in preparation for the next season.

Future plans include the installation of an irrigation system and the addition of certain elements to compensate for today’s technological advances. Deibert offers the par four 405-yard first hole as an example. "Now, with new technology providing better clubs, and balls which travel further, any good golfer can pop it over the sand trap from the blue [professional] tees," he explained. "We might put a sand trap further out and to the left side of the fairway to make the hole more challenging. But . . . we don’t want to punish the golfer."

While the New York state high school championships and various other junior tournaments are held at Cornell, the basic premise set forth by Jones remains. "Every hole should be a hard par and an easy bogey," he stated.

Next time you step up to tee off, take a step back and revel in the brilliant design, maintenance and beautification of the Robert Trent Jones Golf Course. Then pull out your scorecard and pencil in a birdie for Jones and Deibert. They’ve earned it.

by Dan Masonson ’94
New Endowed Positions
John P. Dyson ’65, Ronald P. Lynch ’58 and J. Thomas Clark ’63, MBA ’64 recently gave generous donations to the College of Agriculture and Life Sciences to establish new endowed positions within the College.

Dyson’s gift will create the Kenneth L. Robinson Professorship in Agricultural Economics to honor Professor Emeritus Ken Robinson. The chair holder will be involved in the Center for the Environment and will teach and conduct research in resource and environmental policy. The donation from Lynch will create the Ronald P. Lynch Deanship of the College of Agriculture and Life Sciences; money from the fund will supplement state funding for the deanship position. Clark’s gift, which was made with his wife Nancy Williams Clark ’62, MED ’64 will establish the J. Thomas Clark Professorship in Entrepreneurship and Personal Enterprise. This will help join activities of the College’s Personal Enterprise Program with the Johnson Graduate School of Management’s Entrepreneurship Program.

Sutphin is Named Education Chair

Dean Sutphin was recently named chair of the Department of Education. He is an associate professor of agricultural, extension and adult education. Sutphin came to Cornell in 1982 and distinguished himself as a leader in educational technologies. He has focused primarily on the development of agricultural technologies curricula in high schools and colleges.

Sutphin is presently co-coordinator for Agri-Tech Prep 2000, which will provide a comprehensive approach to teaching agriculture and related fields between high school and two year colleges. In the spring of 1992, Sutphin helped teach the first satellite based course ever offered in the College of Agriculture and Life Sciences. Sutphin also played an integral role in the establishment of the computer laboratory in the Clara Dickson Residence Hall. In addition, Sutphin was recently designated president-elect of the American Association of Agricultural Educators.

A New Vitamin Text

Gerald F. Combs Jr. MS ’71 PhD ’74, a professor in the Division of Nutritional Sciences, is a nutritional biochemist who wrote what he believes is the first textbook on vitamins. His book, *The Vitamins: Fundamental Aspects in Nutrition and Health* (Academic Press, 1992) uses concept-based learning principles developed by Cornell educators. This new approach is designed to increase the readability and usefulness of the text. Although the book is written as a college-level text, it could also be used by physicians and other health professionals.

ALS News Wins Contest

At the National Agriculture Alumni and Development Association Conference in Portland, Oregon, the *Agriculture and Life Sciences News* received a first place award for excellence in the quality of their publication. This was the first time that the national association held a competition to recognize the quality of news publications. The ALS News was among 17 other land-grant agriculture colleges’ publications to take part in the competition.

Honors at Geneva

At Cornell University’s New York State Agricultural Experiment Station in Geneva, Dr. Arthur M. Agnello ’74 was promoted from assistant professor to associate professor of entomology with tenure. Since he joined the station in 1986, Agnello has built a tree fruit extension program that has benefitted many apple growers throughout New York state and the other parts of the country. Agnello is also actively involved in a variety of extension activities and research projects.

Dr. Edward H. Glass former chair of the Department of Entomology at Cornell University’s Agricultural Experiment Station in Geneva was named a Fellow of The Entomological Society of America. This is the highest award that the society grants to one of its members. Glass joined the Geneva station in 1948 and served there for 34 years before he retired in 1982. However, in 1991 he assumed the position of the Executive Director of the Consortium for International Crop Protection.

Throughout his career Glass contributed greatly to the biology and control of apple pests. He also served as a consultant for tropical pest problems and developed innovative approaches to pest control in general. He became a strong proponent of integrated pest management (IPM) technologies, and contributed greatly to their implementation around the world.

National Research Council

Dale E. Bauman was recently appointed as Vice-Chairman for a second three-year term on the National Research Council/Board on Agriculture and Norman R. Scott PhD ’62 was appointed for an initial three-year term. The Board on Agriculture focuses on science and policy issues that affect the agricultural, food and environmental systems. Bauman was also designated as a member of the Animal Health and Veterinary Medicine Committee, along with Hollis Erb of the College of Veterinary Medicine.

Harold F. Hintz MS ’61, PhD ’64 was recently appointed chair of the Committee on Animal Nutrition, which addresses problems and needs in all aspects of domestic animal nutrition. Danny G. Fox was also appointed for an initial three-year term on the same committee.
Cornell

Keeping the theme of this issue of the Countryman in mind, we design our back cover to illustrate several scenes of natural beauty that we Cornellians hold dear to our hearts. The gorges that surround our campus and decorate our town provide a relaxing addition to an otherwise stressful environment. Just a simple look at the breathtaking scenery of healthy trees can brighten up the dark days of winter. And just hearing the rushing water ringing in our ears soothes even the most distracted mind. We love our gorges. Please keep them beautiful so that the next generations of Cornellians and Ithacans can benefit from their therapeutic values.

Forever Green

New York State College of Agriculture and Life Sciences, a Statutory College of the State University, at Cornell University
About the Issue

Students in the College of Agriculture and Life Sciences find themselves undertaking projects in all walks of life—and all parts of the world. This issue of the Countryman follows students on a field trip to Panama, as well as exploring some of their undertakings here in Ithaca. We also will look at some interesting research, including findings about red meat, the benefits of insects, and take a look at a study that involves sheep running on a treadmill. Also, meet some members of the Cornell community who are putting their talents to special use both on and off the Cornell campus. Finally, meet a professor who has witnessed the evolution of the agriculture college, and explore the relationship between Cornell and the new Sciencenter, soon to open in downtown Ithaca.

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WHEN ASKED WHAT A "TYPICAL" college student was, most students made such comments as, "one who parties all weekend, goes to class occasionally, sleeps late, studies when necessary and plays a lot of sports." No mention was made about the possibility of a student working, volunteering, participating in clubs or maintaining decent grades.

Surely there are many students who fit such stereotypes, however these qualities do not pertain to those students named Cornell Tradition Fellows.

This year is the tenth anniversary of the Cornell Tradition, an alumni-endowed program that recognizes approximately 600 students annually for their outstanding achievements in and outside of academics. On this anniversary the College of Agriculture and Life Sciences boasted 185 students; each received up to $2,500, replacing some or all of a loan.

Janiece Bacon Oblak, Director of the Cornell Tradition stated, "The Cornell Tradition was established in 1982 by a group of alumni and friends who were concerned with the high level of debt that students were facing while working toward their Cornell degree."

The organization is maintained by funding provided by alumni and friends, individual families that establish scholarships for certain types of students, and special Cornell clubs and alumni organizations. Senior and reunion classes have also contributed to the fund. Without these sponsorships the Cornell Tradition would not be able to help as many as they do.

Heather Toomey, a senior communication major, received a fellowship her freshman year and has maintained it throughout her time at Cornell. "I was very excited when I first learned of receiving this scholarship because I was not sure how I was going to finance my education. All of my other college choices involved a lot of loans. This program has allowed me to get a high quality education with minimal debt."

Students who are chosen to receive this prestigious award not only excel in academics, but contribute many hours of volunteer service to the communities in which they live.

In order for Fellows to maintain their scholarships, they must complete at least 200 hours of paid work during their freshman year at Cornell or 250 hours during their upper-class years. They must be involved for a minimum of 75 hours in volunteer work in community service projects, and in campus activities that contribute to the University and its mission. All Fellows must also maintain a 2.3 cumulative grade point average in a full-time degree program.

The Cornell Tradition offers a great reduction in the level of debt students acquire and provides opportunities for each student to get to know several faculty members through small group activities. Many Fellows take advantage of internships that are strictly designed to provide extended experience in or outside their specific field of study.

"Perhaps the most important goal of the Tradition is to create a sense of community and identity with people who are doing the same things within the Cornell community," stated Oblak.

Mark Bay '93, received a Tradition fellowship for the first time this year. He had developed a strong work and service background during his time at Cornell, making him eligible to apply.

Bay participated in the Fellowship program, which is yet another opportunity the Tradition offers to students who want experience that is career-related, yet shorter than an internship. He spent several weeks working with Cornell Cooperative Extension of Yates County, enabling him to prepare for his future career in education.

Bay added, "I think it is great to have a fellowship that awards those students that work hard that might not necessarily have just high grades."

Senior J.J. Schultz spent six weeks last summer in the Ukraine visiting various dairy farms and processing plants. It was an interesting experience for him in that it tied very closely to his food industry management major.

Not only did he learn some unique ways of processing milk, but also learned many valuable lessons he could apply directly to his own life. "I never thought I could ever do something like this, I learned a lot about myself. I also learned that the more you give, the more you get in return. The world needs people who will volunteer, share; I found it all comes back to you ten-fold."

Oblak predicted that the Tradition will only be able to continue offering aid to 600 students annually. However, she is optimistic about the continual growth of the endowment, and looks forward to each Fellow having a personalized fellowship from additional donors.

Her optimal goal is to establish more current contacts between Tradition alumni and Fellows in order to create area support groups, along with more funding, work and service opportunities.

Schultz summed up the Tradition program very nicely. "The Cornell Tradition is a phenomenal program in that it provides students not only with financial support, but with the kind of support that enabled me to visit the Ukraine. The Tradition is a service-oriented. It has been a guiding light in helping me get through Cornell. I could not say enough about this program."

So before you are too quick to place all students under one stereotype, remember those who are working, volunteering, getting good grades, and still having a lot of fun; remember the Fellows of the Cornell Tradition.

by Dietre D. Richael '95
Dr. Stanley A. Zahler
An Eyewitness to Change

HE IS A MAN WHOSE WORK HAS BEEN published by Science, Nature, the Journal of Bacteriology, Genetics and Gene, just to name a few. He was present at the symposium in which James D. Watson presented his model of the structure of DNA. He has worked with science greats such as Salvatore Luria. He is a legend at Cornell University.

During his 33 years at Cornell University, Dr. Stanley A. Zahler, Chair of the Section of Genetics and Development in the Division of Biological Sciences, has been in three buildings, two different departments—whose names have changed five times—and has witnessed numerous changes in the field of genetics. In the spring of 1994, Zahler will retire after a long and fruitful career.

Zahler has always been interested in bacteria and how they function, so as a graduate student he studied microbiology. At that time there was little known about the genetics of bacteria. In fact, Zahler only took one genetics course during his undergraduate years and none as a graduate student. After completing his bachelor's degree at New York University, he went on to the University of Chicago to pursue his masters and doctoral degrees. Zahler received his PhD in 1952, just one year prior to the discovery of the structure of DNA.

He worked as a post-doctoral fellow in the lab of Salvatore Luria, the famous virologist who received the Nobel Prize. Prior to Luria and his co-Nobelist Max Delbruck's discoveries, it was not clear that bacteria had genes and mutated like other organisms.

In 1953, as a post-doctoral fellow, Zahler, while working with Luria, went to the Cold Spring Harbor Symposium. It was at this symposium that James D. Watson presented a 20-minute talk on the structure of DNA which rocked the science world and was the prelude to molecular biology. "No one doubted it from the first instant," said Zahler, "it was electrifying, incredibly inspiring." One scientist at the symposium actually left and caught a plane back to his lab at the University of Michigan, told his lab technician how to test the DNA model that Watson had proposed, and then flew back for the rest of the symposium.

Watson was Luria's first graduate student, so Zahler was able to meet and talk with Watson. "He was rather odd and eccentric and spoke with a very strong English accent even though he was originally from Indiana. He was twenty-three but looked about seventeen. He wore shorts and sneakers—as we all did—but he never tied his shoelaces. Someone from Luria's lab actually knocked Watson down and ripped out his laces so he wouldn't trip on them," Zahler said, chuckling over the recollection.

When he first came to Cornell, in 1959, Zahler worked in a microbiology lab which was located in the dairy science department in Stocking Hall. In 1964, the Division of Biological Sciences was created. In 1972, Zahler left microbiology, went to Bradfield Hall and joined what was then the Section of Genetics, Development and Physiology, which was changed, in 1977, to the Section of Botany, Genetics and Development. And in 1980, the section changed once more, and is today the Section of Genetics and Development in Biological Sciences.

Over the years, Zahler has watched
the field of genetics get "enormously bigger." However, it has not divided into many subsections. "You could [at Cornell] take eleven people from genetics and development, four from biochemistry and about three from microbiology and even though we work on different research projects we all speak the same language," said Zahler.

Since he first learned to work with *Bacillus subtilis*, while on sabbatical leave in California in 1968, all of his research has been with this species. He works on the control of genes and their expression and studies bacterial enzymes through chemical reactions.

"The field of genetics has been very useful in teaching us about ourselves, who we are and how we work," said Zahler. At present there is immense turmoil in the genetics field due to the ability to clone genes. "We now have the ability to produce any kind of material that animals and plants make," he said. Present-day techniques allow for much deeper insights. The technology has become very complex. Zahler added, "I learn all of the new techniques from my graduate students."

Mike Charissis '94, an undergraduate student who has worked at Zahler's lab for almost three years, tells of how he got his job. "I attended an open house for biology majors when I was a freshman. Dr. Zahler happened to be there and I asked him how I should go about getting a job. He told me to go to his office the next day. That next day he gave me a job in his lab. He made me feel like I was important, and not just an insignificant little freshman."

In addition to doing his research Zahler has taught microbial genetics for the past 32 years. "I really enjoy teaching. I wouldn't like to do just research," he said. Zahler enjoys teaching 400-level courses because "you get students who are really interested in the topics. Working with young people keeps you alert," he said smiling. Over the years his lecture class has increased from ten students to as high as 110. His lab class has averaged around 11 students, all of whom are undergraduates. Upon Zahler's retirement, Dr. Valley Stewart will take over the microbial genetics lecture, but the microbial genetics lab will no longer be offered. "No one is interested or equipped to take over the class," said Zahler. "The lab took a great deal of time and effort. My research and the course were intertwined."

A student of Zahler's, Ramiro Gutierrez '94, who took both microbial genetics and development, said that Zahler was constantly available, helpful and very approachable. "At each class we received a handout containing references and diagrams with all of the lecture material credited so that students could go and look up any reference they needed. Each handout was about five pages long and single spaced," said Gutierrez. "Dr. Zahler also gave us a historical perspective on the material we were learning. His lectures were full of anecdotes, and much more interesting than learning from a textbook."

On the last day of Zahler's teaching career last semester, his colleagues in the Section of Genetics and Development came into his class to celebrate his retirement with him and his students. They toasted with cider and ate cookies, and Zahler received both a plaque and a long, hearty round of applause.

Dr. Mariana Wolfner '74, a present colleague and former student took the microbial genetics lecture in the fall of 1973 when she was an undergraduate student in the College of Arts and Sciences. She brought the lecture handouts she received in Zahler's class with her when she went to graduate school at Stanford University. "Those notes were invaluable," said Wolfner, "they had hundreds of helpful references, not just from books but from the original research papers." Now, as his colleague, Wolfner has observed those notes and references in the making. "He [Zahler] spends many hours in the library making sure his classes are up to date and he updates his reference lists every year."

Since Wolfner came to Cornell, nine years ago, she has worked on the same floor as Zahler, both in Bradford and now in the Biotechnology Building. "At first it was a little difficult to think of my former professors as colleagues. It was hard to think of Dr. Zahler as 'Stan', and not 'Dr. Zahler'," said Wolfner. "But Stan made the transition very easy for me. He is very easy to talk with, and very interested in sharing ideas." The Section of Genetics and Development is a tight-knit group. As Chair, Zahler sets policy, "but he does it by asking us," said Wolfner.

When he retires he will be sorely missed by the genetics section. "I will miss him as a teacher of microbial genetics, as a scientist and resource person; he is comfortable in many areas of science," said Wolfner. "But, most of all I will miss his personal side, his wisdom in dealing with people and his sense of humor. He is a very special person, greatly loved and respected. And underneath that sometimes gruff exterior he has a heart of gold," she concluded.

Zahler will work at Cornell through the spring of 1994, finishing up his present two lab efforts. One has to do with bacteria and their synthesis of amino acids; the other is studying how bacteria break down sugars after they have stopped growing. "It is very unusual. Bacteria are supposed to just sit around after they stop growing," said Zahler.

What will Zahler do after he retires? "I have no idea. Maybe I'll sleep for the first six months," he jokes. Eventually he plans to do some writing, perhaps a book for teens on the subject of genetics. For now he has no concrete plans, but he does not intend to stay involved at Cornell.

"Thirty-five years is enough," he said.

When Dr. Zahler retires he will be missed by many. He said that the secret of his success was that "I kept doing the things that interested me as the world around changed." Leaning back in his chair, in his spacious office in the Biotechnology Building, he smiled. "If you had asked me back in 1955 what I wanted to do in life my answer would have been exactly what I have done for the past thirty-eight years."

by Mary Kate Conroy '94
WITH SPRING IN OUR MIDST, ONE cannot help contemplating all of the wonderful things that come to life as a new generation of leaves, flowers and animals appear all around us. Spring is a reminder that life is plentiful—patiently waiting to sprout and exhibit its beauty through its many forms.

Unfortunately not all forms of life are welcomed with open arms. Spring is often associated with the re-introduction of insects into our valued ecosystems. Insects return in such an abundance that spring is often coupled with swarms of gnats flying around our heads, occasional mayflies penetrating the best of screens and the ever-threatening bees and wasps that evoke fear in the minds of the otherwise joyful children.

Insects have seldom held a warm place in our hearts. With the exception of the entomologists, we only remember negative images of insects, such as locusts devouring whole landscapes, valuable crops being utterly destroyed by Japanese beetles and killer bees dangerously making their way up north. These images have been perpetuated through our lifetime with no mention of the incredible benefit insects have been to both humanity and the environment.

After conversing with entomology students at Cornell, it was obvious that insects have had a bad rap. In light of this coming spring season, it seems important (at least for the insects' sake), that these creatures receive some recognition for the use they have been to humanity.

Although it would be impossible to mention all of the benefits we have gained from insects, it is possible to briefly mention some of their more notable contributions. Metcalf and Metcalf's *Destructive and Useful Insects* devotes an entire chapter to the many forms of useful insects that exist on our planet. Humans have long been profiting from the insects' hard work. According to the United States Dairy Association insects account for products that sell for more than $300 million in the United States alone. The most profitable insect product in the United States by large is honey, which is currently a $273 million industry. Although honey is an almost ubiquitous item in our households, the labor required to create what we so happily consume is often undermined by the threatening manner in which hard-working bees are portrayed.

Although plants secrete nectar in profusion, they do so in such infinitesimally small individual amounts that it would be virtually impossible for humans to collect it without the honey bees. The honey bee is required to make 40,000 to 80,000 trips to synthesize one pound of honey. With the average distance of a mile and a quarter for every trip, the honey bee travels twice the distance around the globe to produce one pound of honey.

Silk is another insect product that merits mentioning. Silk is definitely one of the more lucrative of insect products—although silk may lose some of its aesthetic value in the minds of people when they realize that it comes from a caterpillar's spittle. The silkworm excretes silk which serves as the casting for its cocoon at the termination of its larval stage. Each cocoon is constructed from between 800 and 1,200 yards of silk which is spun around the caterpillar to form its temporary home.

Caterpillar spittle or not, 75 million pounds of silk are produced in Japan, Italy, China, India, France and Spain which amounts to a very profitable $1,300,000,000 industry.

There are other commonly used products that many fail to realize come from insects. Shellac, for example, is produced by the lac insect which uses the substance as a home.

Although these products are truly beneficial and profitable, they are insignificant compared with the benefits some insects provide by destroying others. These insects, or *entomophagous* insects as they are called, have long been considered advantageous by entomologists. But it has not been until recently that they have received the attention and recognition they deserve.

*Entomophagous* insects are divided into two distinct groups: parasites and predators. *Metcalf and Metcalf* mentions that predaceous insects catch and devour smaller or more helpless insects where as parasitic insects make their homes in and feed off larger, stronger insects. Both, however, are equally important in the fight against devastating insect pests.

The ground beetle is considered to be a farmer's best friend because of both its predaceous habits and large appetite. In the 1980s, *Calosoma sycophanta* (a type of ground beetle) was introduced to the New England area in an effort to control the dangerously growing gypsy moth caterpillar population.
These ground beetles each destroy several hundred caterpillars in their lifetime. The beetles' large appetites for gypsy moth were effectively put to use as gypsy moth populations were substantially reduced in the New England area.

While not as ferocious as predators, insect parasites are just as lethal. Insect parasites attack their victims in an assortment of ways. Some inject their eggs into the bodies of their hosts, others become inhabitants of their hosts for most of their lifetime, while still others live on the surface of the victim's body.

Most of the valuable parasites are contained in the aculeate Hymenoptera, which includes what we consider stinging insects like wasps and bees. The stinger, however, is not always used to cause us pain. It is actually a modified egg laying apparatus which is conveniently used to inject eggs in the hosts.

The Scelionidae, for example, deposit their eggs via their stingers (ovipositor), into the eggs of insect pests where they grow to maturity. The Scelionidae's total life cycle requires only 11 to 23 days, the conclusion of which means inevitable death for the host. Because of the brevity of the wasp's life cycle, there are approximately nine generations of parasitic wasps each year—which translates to many dead hosts.

Many parasitic species work in the same manner, eliminating hundreds and thousands of harmful insects as generation after generation of wasps mature in the bodies and eggs of their hosts. Beth B. Norton PhD mentions, in an essay entitled "The Importance of Stinging Insects", that the aculeates are the most important of the entomophagous insects because of the frequency and effectiveness of their attacks.

The amount of money saved from the management of pests by parasitic insects is astounding. Ron Gardner of the Integrated Pest Management Educational Program at Cornell University made it clear that entomophagous insects are not only beneficial, but may one day be truly profitable. There are already companies that have incorporated the use of entomophagous insects in pest management. One such is New York Integrated Pest Management, which is located in Locke, New York.

A big advantage in using insects in place of chemical pesticides is that insects are not pollutants. Insects are already being used in place of some chemical pesticides. Gardner pointed out, however, that there are inherent problems when these insects are used in vegetation that is processed as food. Although the insects do not contaminate the produce, their presence does add to the insect body count when the food is processed. Helpful or not, dead bugs are not a desirable item in anyone's salad.

Unfortunately, no article is long enough to mention all of the benefits insects provide in their lifetimes. Insects are beneficial to us in terms of fruit production, the control of weeds and pests and in the role they play in scientific research and medicine. This is not to mention the insects' aesthetic value as we watch them fly gracefully over flower-covered meadows all summer.

So as the daisies begin to blossom and the birds begin to chirp, let us not forget the thousands of insects working diligently for our benefit; let us pay homage to the insects.
THERE'S A HOLE IN THE OZONE LAYER.
The last of the Pacific old-growth forests are being destroyed. The water in Six Mile Creek foams so much that one can scoop the frozen ooze from the ice and admire mankind's handiwork, and as Jerry Garcia, guitarist for the Grateful Dead said, "This space is getting hot."

"What to do, what to do" one might ask. A concerned Cornelian named Mark Urbanski '92 asked just that in the fall of 1990. His answer was Ursus, a student founded and run organization that explores environmental issues of any sort in its biannual publication.

Urbanski said that Ursus was created to fill a need that he recognized at Cornell University. "There is such a diversity of expertise at Cornell. I lived at Ecology House and I was surrounded by experts in several dozen fields." He felt that a journal like Ursus would provide an excellent writing outlet for this vast cache of ecological knowledge. As he toyed with the notion it was met with much approval.

Connie Fuess, Director of Ecology House and advisor (the position of advisor to Ursus is now in her job description), was an original advocate of the plan. She has seen the organization grow from "infancy to adolescence." As Ursus becomes more independent of its advisors, Fuess becomes more content with her role. "An advisor's job is to make that job, in essence, obsolete," she said. She feels that the publication is a bridge between students and faculty as well as between students of different academic backgrounds.

What Urbanski stressed was the magazine's commitment to objectivity. Printed in every issue are these words, "Ursus is a student publication at Cornell University offering students a multi-disciplinary forum for the expression of their diverse perspectives on environmental protection, ecological understanding, and appreciation of natural life," which convey his sentiments.


To attend a staff meeting today is to witness all of the hustle and bustle characteristic of a professional publication. Staff members critique prospective pieces as the current editor-in-chief, Jenifer Lienau '93, leads the discussion that makes or breaks the article. Suggestions, as well as jokes, are fielded from the 20 or so staff members.

"Interest is constantly rising," said Anthony Carpi, a graduate student in environmental toxicology and editor-in-chief elect for the fall 1993 issue. As Lienau put it, "We've come a long way since we started, I mean we've filled every position we can think of!" She feels that the forum owes its success to simple word of mouth communication. This advertisement system is actually extremely effective—copies of Ursus have been found on the west coast of the United States!

As for what she feels has accomplished in her year and a half as editor-in-chief, Lienau said that there has been more input from regular staff members than ever before, and the magazine has seen a creative explosion because of it. Now when the new issue of Ursus is distributed, people are waiting eagerly for its release. "It's great to hear someone say I've been waiting to see this!" said Lienau.

It was not always this way however, as
Greg Berger '93 attested. “We started with a staff of five people ... meetings would go five to six hours.” In those days all of the articles in the publication were staff written, consequently the task of publication was a formidable one. After losing gallons of sweat, Urbanski, Berger and clan finally produced the first issue of Ursus. How were they rewarded for their heroic efforts? Said Berger, “As we were handing out the first issue, someone asked ‘Is this a religious thing?’”

Now that people are aware of what Ursus is and stands for, what comes next? According to Carpi, who will take the reigns in the fall, Ursus is about ready to expand. He points to the formation of two new branches of Ursus as evidence of this. One is Ursa-Minor, a product of Donald Stephenson '94's intuitiveness, and the other is the availability of back issues of the Forum on the University's computers in Martha Van Rensselaer Hall.

Ursa-Minor is a publication devoted to increasing public awareness of environmentally oriented groups and programs on the Cornell campus. Said Stephenson, “Because of ignorance many people miss speeches and lectures that they are interested in. Now hopefully they won't.”

Among Carpi's plans for the future are expanding the number of copies produced from 2,000 to 3,000, increasing the subscription base, and slightly changing the genre of articles printed. “We've seen a lot of opinion, or philosophically oriented pieces. I'd like to see more research, or informative articles.” To solicit such articles would require more people than Ursus has had access to until very recently. With the increased interest of late it seems that Carpi may just get his wish.

Also on the proverbial table is an idea that will further validate Ursus' claim to the title of Forum. Berger, Carpi and Lienau all expressed enthusiasm for Ursus-sponsored forums to be held on “anything environmental,” an idea that seems far off—but as they have shown, raw determination and hard work can accomplish the astonishing. The road that Ursus has traveled is a long one, one that was forged, according to Carpi, “in the jungle with a few machetes,” and has, as Berger said, “meandered through the administration of Cornell” (Ursus is funded by the Student Activities Fund) to finally open up black and smooth before them.

As Anthony Carpi slips behind the wheel of the vehicle that is the Forum, one anticipates its coming of age.
DARK DREARY CLOUDS LOOMED IN the sky on a chilled August morning. Rain drops streamed down, overflowing every puddle, making the site look like one of the Finger Lakes. It was early but a few trucks were fish-tailing up the main road in an attempt to escape the muddy sea. Everywhere you looked there were yellow rain slickers dotting the site like dandelions in a field. They were parading through the mud, slipping and sliding. Mud was the word of the day at the opening of Empire Farm Days 1992.

Empire Farm Days, the largest agricultural trade show in the northeast, is a 350-acre show with over 400 exhibitors from all parts of the nation. The show is hosted by a prominent agricultural family on a site designated by the Empire Farm Days Committee. For the past five years the show has been held in Seneca Falls, N.Y. and hosted by the Rodman Lott and Sons Farm. The Empire State Potato Club, Inc. is the sponsor of Empire Farm Days in cooperation with other agriculturally related institutions such as the New York State College of Agriculture and Life Sciences and American Agriculturist. Exhibitors construct elaborate displays, show live demonstrations and “wow” show-goers with the latest in agricultural equipment, techniques and programs.

There are many people behind the scenes who make Empire Farm Days the premiere farm show of the northeast but the one in charge of it all is Melanie Wickham ’82. Wickham, who holds a BS in communication arts, began working with Empire Farm Days in 1986 when it was held in Pompey, N.Y. That year she was assistant manager to Richard Amidon, who was planning to retire. She worked in conjunction with Amidon to get a feel for the show, its exhibitors and its clientele.

Before becoming involved with Empire Farm Days, Wickham gathered much experience throughout the local agricultural media industry. During 1983-1984 Wickham was a writer and photographer for the Farm Forum, an ag publication out of Auburn, N.Y. She spent the next two years as manager of the production department at the New York State Agricultural Experiment Station in Geneva, N.Y. She was responsible for all of the publications that were generated from the Experiment Station. Her main duties were editing and research. Her next move took her to her present position as manager of Empire Farm Days where she is entering her seventh year.

Making the transition to manager was relatively smooth, Wickham said. “Any challenges I may have encountered weren’t gender-related, but I followed a man who managed the show for more than twenty years and I came in while in my mid twenties. People thought I was young and seemingly inexperienced.” She also noted that “There were some skeptics, but generally, everyone gave me a chance to prove myself.” She certainly has proved herself and is praised by many throughout the agricultural industry. She is currently a member of the New York State Agricultural Society which is a group of prominent people from within the industry.

Bob Martens, Empire Farm Days Committee member, praised Wickham, “She began working for Empire Farm Days when the show had fallen into a stagnant rut. She brought new and fresh ideas with her that have consistently improved the show.” Martens has known Wickham since she first began to work the show and stated, “She has earned the respect of the people she works with through her professionalism and her accomplishments with the show.”

Jason Finnegan, Empire Farm Days field crew member, stated that, “Melanie is very confident while working under stressful conditions. She is always on the
Melanie Wickham, Show Manager, in conference with a colleague. Dean David Call is at left.

Wickham and her staff. Early June is the contract deadline for guaranteed space at the show. Wickham then moves her permanent office in Stanley, N.Y. to a trailer on the show site in Seneca Falls, N.Y. From July until the end of the show in August, all Empire Farm Days business is conducted in the confines of that 20-foot construction trailer. Three weeks before the show the 350-acre is staked out, exhibit by exhibit, with baling twine and wooden stakes. Wickham and her field crew use tape measures and "the luck of the eye" to transform the field into small plots eager to house each exhibitor and their products. After this tedious task has been completed the contracted tent company, Lafayette Tent and Awning out of Indiana, assembles many of the tents that will cover these plots. Finally, for the three days of the show in early August, 100,000 people flock to Seneca Falls. Wickham states that throughout this she is "busy". "It doesn't slow down until all of the equipment is moved off of the site, my office is put back together in Stanley and the many thank you notes have been written, usually the end of September."

One of her most memorable experiences as manager of Empire Farm Days happened on the first day of the show, August 4, 1992. Wickham stated that the week before the show, Seneca Falls had been dumped on by heavy rainfall. Her job intensified as she had to make alternative plans for parking the show-goers' cars. She stated that at that point it was obvious that the fields used as parking lots might not withstand much more rain. She observed this scene early in the morning on opening day 1992. "As I sat in the golf cart in the north parking lot I could see the storm rolling our way and I had to make a decision on the spot to move to plan B which was parking all of the show-goers' cars off site. This was the first time in the 59 years of the show that this type of circumstance had come up and it was major," she said laughing. "Now when I look back I see that everything went smoothly, so, of course, it was the right choice but at the time I was a bit worried." Another memorable incident she cited happened in her first year with Empire Farm Days in 1986. "The Monday before the show, one of the most hectic days, we found out that one of the forklift operators was illiterate." She noted that this was quite a problem since he couldn't read the signs marking the roadways on the site. Thus, he was of no help unloading equipment because he could not find the exhibitor's lot. "We would dispatch him, telling him what street to go to and what exhibit to look for and the next thing you know he would be in the absolute wrong spot, just sitting there," Wickham said.

As opening day of the 1992 Empire Farm Days drew to a close, the last group of people boarded a bus to head back to the parking lot in town where they had parked their cars. One gentleman in a straw hat with bib overalls and a cane mumbled to his wife about what a good job the Empire Farm Days show staff did dealing with the rain and mud. The sun peeked through a cloud to make its first appearance in days. Exhibitors dispersed, leaving their exhibits for a glorious dinner paid for by their company's expense account. It was five o'clock, quitting time for most of the work force. Wickham and her staff though, had much work to do cleaning up the mess after an afternoon downpour. "Here's to a long night," one crew member said to another as they clanged their Pepsi cans and grabbed for another piece of cold pizza on their dinner break. The word of the first day may have been mud, but the word of the 1992 Empire Farm Days was success.

by Karen Wickham '94

For the past six years Empire Farm Days has been held on this 350-acre site.
ELVIS HAS GOTTEN INTO THE EXERCISE craze. So have Scooter, Eyeball and Freckles. They are sheep that spend their days walking on a treadmill so graduate student Pauline Entin can study the effects of exercise.

Entin's lab, which doubles as her office and a home to around a dozen sheep, is actually home to three ongoing studies on the effects of exercise. She, along with David Robertshaw, chairman of the physiology department in the College of Veterinary Medicine, and Richard E. Rawson are looking for the biological signals that trigger the body's cardiovascular system into high gear. "When you go and actually look for the signal that tells the brain 'O.K., we're exercising now,' you better get oxygen consumption up,' it's really hard to find," Entin said.

She is also investigating whether or not that signal is "hard-wired," which is what scientists call any innately known biological system at the minute of birth.

Professor Michelle Mottola of the University of Western Ontario, is looking at the effects of exercise on fetal development. Specifically, Mottola is examining the rate of blood flow to the fetus while other parts of the body indicate that they are in high need of blood. "When you're exercising," Entin said, "there's more of a demand for blood. The fetus is somewhere in the hierarchy," although Entin said the legs will get the highest priority relative effect of the blood loss on fetal development is not known yet as the results have not been analyzed.

The fetal temperature also has repercussions on further development. "It can be detrimental if the fetus gets too hot," Entin said.

The only way a fetus can lose heat is during strenuous exercise.

While the mother sheep is running on the treadmill, Mottola is looking for two primary things: blood flow to the fetus and temperature of the fetus. Entin said that blood flow to the fetus during exercise is usually lower than the normal flow, which has obvious physiological repercussions. However, Entin said the...
through the mother, so heat gain is a problem during exercise. "If the mother is hot, then the fetus is hotter," Entin said. This can have severe repercussions if the fetus is too hot during a period of brain development. While it may be tough to measure actual harm done to a fetus ("How do you test a sheep's memory?" Entin jested), there are some proteins released when the temperature is too hot that may signify tissue damage.

The results of experiments on fetal development with respect to its mother's exercise becomes relevant to humans when you consider the number of pregnant women in the workforce. "Women are not necessarily leaving their jobs until they go into labor. We need to know what the effect will be, especially of doing something like waiting tables or exercising while you're eight months pregnant," Entin said.

While Mottola continues to look at pregnant sheep, Elvis (a female sheep who was named after a bad shearing job left her with sideburns) and her companions continue to exercise on the treadmill while Entin looks for the signal that tells the heart and lungs to increase blood flow. A logical theory states that whenever a message is sent to a skeletal muscle, a parallel message is sent to the heart and lungs telling them what—if any—increase in circulation is needed. However, Entin said that theory falls apart when you do "involuntary exercise." Studies have been done to show that when a muscle is stimulated by electrodes, the autonomic nervous system still increases heart rate and blood flow in response to that exercise.

Entin said researchers all over the country are looking for the mechanism that creates this response. "Once you understand how something works," she explained, "you can go back and look at the pathologies."

So, in the name of science, Elvis, Eyeball, Scooter and Freckles all exercise on a treadmill (sometimes unwillingly) while researchers monitor physiological responses to various stimuli. While all these studies are taking place, Elvis and friends are becoming some of the most physically fit sheep in the world.

by J. Eric Docktor '94

A mother sheep and her one-week-old lambs look on with curiosity.
YOU ARE IN A PLEASANT RESTAURANT scanning the menu before dinner. The idea of a well cooked sirloin steak sounds delicious, but you remember the warnings, “Don’t eat too much red meat!” You order a chef salad. When the salad arrives, it is drowned in dressing which in fact contains more fat than the lean steak which you could have ordered.

The 1992 Statistical Abstract of the United States, published by the Department of Commerce, shows an overall decrease in the per capita consumption of red meat in the United States between 1970 and 1990. Although one should not consume too much red meat, there is hardly cause to exclude it from one’s diet. People generally seem to view red meat as unhealthy, which according to Dennis Miller PhD ’78, a professor of food science and nutrition, is not necessarily the case. He stated, “There are no well-founded nutritional reasons for avoiding meat in the diet, but we should limit the portion size that we eat.” Associate Professor in Animal Science and Food Science Donald H. Beermann said, “People have a perception that meat is a fatty food, which is a broad misrepresentation.” However, the meat industry has decreased the fat content of retail cuts and most meat products in an attempt to satisfy consumer demands for leaner meat. According to Beermann, a greater variety of lean meat and low fat meat products exists today than ever before.

Meat provides an excellent source of protein and many of the essential vitamins and minerals required in the human diet. Furthermore, these nutrients are in a readily accessible source when present in meat. Miller stated, “It is certainly possible to get the essential nutrients in a well balanced vegetarian diet but it requires more careful planning.” Some nutrients, such as vitamin B-12 must come from an animal source (such as meat, eggs or milk), since they do not exist in plants. Other nutrients, such as the minerals zinc and iron are present in plants, but are more readily utilized when they come from meat. In addition, meat also contains a high concentration of protein, although it does not contain as much as some bean products.

However, according to Beermann the average adult in the United States consumes more protein than necessary, but more importantly, the average adult also consumes too much fat. Meat products do not present the only reason for this discrepancy. Beermann stated, “For example, in nuts there is a higher percentage of calories that come from fat, as compared to lean meats. The facts are there, but the public perception is different.” Miller considers portion control as one means to prevent this disparity between what people need and what they consume. “A 12- to 16-ounce steak is not such a good idea, a three-ounce serving is more appropriate,” he said.

The United States Department of Agriculture (USDA) recently recommended that people limit the fat in their diets to 30 percent of their total caloric intake. To satisfy these consumer demands, the fat content in meat has changed dramatically in the last 10 years. Beermann referred to surveys conducted between 1990 and 1992 which showed that pork has 31 percent less fat and beef has 20 to 25 percent less fat than was present 10 years ago. Today, workers trim retail cuts more closely to remove much of the fat. In addition, meat animals today, especially beef cattle, simply have a lower fat content throughout their body than was present 40 years ago.

Additionally, consumers can also choose between various cuts of meat that contain different fat concentrations. Processed meats such as salami, bologna, breakfast sausage and some kinds of hamburger are high in fat, while a round roast, for example, contains relatively little fat. However, Beermann stated, “If one takes a composite profile of all retail cuts of meat, they contain only...
seven to nine percent fat on average." If someone is concerned about the level of fat in the diet, Miller stated, "One does not need to give up meat, just control the portion size, choose 'select grades' and trim the fat."

In 1992, the USDA made significant changes in the structure of a recommended diet to insure adequate nutrition, minimize fat intake and control the levels of sugar and salt. Researchers replaced the idea of "four basic food groups" with a "food guide pyramid". Food products are described at different levels of the pyramid as they relate to the proportion that they should represent in the diet. The bread, cereal, rice and pasta group lies at the base of the pyramid where one needs the greatest number of servings. At the next level one finds the fruit and vegetable group. The next level up includes dairy products, meat, poultry, fish, dry beans, eggs and nuts. Finally at the top one finds the fats, oils and sweets which one should use sparingly.

In the brochure for the "food guide pyramid", the USDA emphasizes that each group provides nutrients required for a healthy diet, and that no one level is more important than another.

An additional way to limit the quantity of fat in the diet is to reduce the concentration of the fat in meat that people consume. Although tremendous reductions have come from simply trimming the retail cuts more closely, there are other more sophisticated approaches as well. According to Beermann, the economic incentives to explore different options only re-emerged in the last five years. Today a producer receives payment through a price scheme that is based on the composition of the animal; a premium is paid for leaner animals. Beermann explained that a great source of inefficiency occurred in the past, when animals were fed a grain-based diet ad libitum or "to appetite" so they could quickly achieve market weight. This causes excess energy consumption, more than is needed for rapid muscle, bone and organ growth. The animals then converted much of their feed into fat which would subsequently get trimmed off after slaughter. Miller stated, "At the production level there is an impressive change in the fat content of the animals that go to market. Beef animals of the 1950s were extremely fat; today's animals are much leaner due to government recommendations and public demand."

Some of the techniques that researchers use to produce leaner meat include breeding superior animals, improving the animals' diets to match nutrient requirements and using compounds which improve the metabolic efficiency of nutrient use for growth. One can breed and genetically select for animals that naturally use nutrients more efficiently by producing muscle tissue instead of storing nutrients as fat. In addition, one can "fine tune" animal diets so that they gain muscle as quickly and efficiently as possible without consuming excess energy. Beermann said that a group of scientists in the United Kingdom discovered that some of the published nutritional requirements for pigs were incorrect and that intake of specific amino acids, or total protein intake was deficient for some modern genotypes. Experiments conducted by Dean Boyd in the Department of Animal Science here at Cornell confirmed these results. In addition, Beermann stated that today the average pork carcass consists of 46 to 50 percent muscle, 11 percent bone and 30 percent fat, but it is possible to have 60 percent muscle. He believes that, "There is a lot of latitude to improve pork carcass composition simply through genetics and the diet."

Another means to improve lean muscle growth lies in the use of products which are metabolism modifiers. However it often takes a long period of time for the Food and Drug Administration (FDA) to approve the use of compounds developed for use in animal production. In addition, Beermann believes that consumers often strongly resist the idea of chemical use or new technologies in food production. He cited the example that some consumer groups will not tolerate surface irradiation of food on a large scale even though it was proven to be effective and safe, and is currently used on strawberries. Beermann stated, "Bacteria are the number one cause of food-borne illness, not chemical residues. Last year out of the 400,000 analyses conducted for chemical residues in poultry and livestock, only 0.36 percent were in violation. This was mostly the result of inadequate holding time before slaughter. We need a tremendous educational effort to help consumers understand the safety of these technologies, and it will be difficult."

Through a variety of new technologies the meat industry has responded to consumer demands for leaner meat. However, Beermann pointed out that, "People need to be able to track sources of fat in their diet as a cumulative effect on a daily basis, not just as one food is good and one food is bad. There is also a great need for universities through their extension programs to educate the public."

Although one should not have a 16-ounce steak five days a week, there is no need to swear off pork chops for the rest of your life. Beermann sensibly stated, "Moderation is still the best policy."

by Daniel W. Simon '93
A Trip to PANAMA

DURING THE 1993 FALL SEMESTER A group of 13 students, both undergraduate and graduate, met to discuss ways to study various neotropical organisms in the wild. Led by Professor Steve Emlen and Professor Paul Sherman, both of whom are in the Section of Neurobiology and Behavior, the students prepared projects and experiments that they would use later when they went to Panama for an eleven-day field excursion.

Thanks to the funds received from the College of Arts and Sciences, each member of the course Neotropical Field Behavior only had to pay $100 for the trip.

On January 11, 1993 the class flew to Panama. After landing in Panama City the group travelled to a nearby town called Gamboa. They were told that they would be staying in an old abandoned school house and feared the worst. "We were expecting a rundown old place," said Barrett Klein '93. "However, the schoolhouse turned out to be quite spacious and nice for it had recently been renovated by the Smithsonian." These Cornellians were the first to stay in the building. After a semester of planning, the class was finally ready to go into the field to test their ideas.

Two main sites were used to examine the wildlife. One was Pipeline Road and the tropical moist forest that the road penetrated. The other was a site located on the Chagres River, not far from the Panama Canal.

Every day the diverse group of students who had interests ranging from herpetology (the study of reptiles and amphibians), to insects or birds, would venture off into the wild. "It was funny to see the group walking to a site," said Klein, one of the students who went on the trip. "Everyone was either looking up at the sky for birds or looking at the ground for bugs."

Once in the field, the students applied the experiments they had designed in the classroom, and they hoped they would be able to figure out how to correct their failed experiments. "The idea behind the trip was to go into the field with your preplanned preconceptions for the conducting of behavioral research," said Klein, "and face the consequences so that you are forced to work on the spot and make alterations to your designs and plans."

Several factors, like inclement weather, the inability to locate an organism of study, and the unexpected appearance of predators could affect these preconceived experimental designs.

During the eleven-day stay each student was able to study each of the four organisms that were chosen by the group. While in the field, the group would split up and gather information.

One surprise the group encountered while in the field involved the social spiders (Anelosimus eximius). While the members of the group had prepared experiments for this organism while in Ithaca, they did so with little hope of finding the creatures during their stay. However, while walking along Pipeline Road, members of the group noticed a huge hammock-shaped web. This discovery enabled the students to try some of their experiments.
Another organism that was studied was the golden collared manakin. With this organism, the group was limited to mainly observational research rather than manipulative. The reason was that there was a low sample size and the bird appeared infrequently.

One organism that was not scarce was the leaf cutter ant (Atta columbia). "While walking around," said Klein "one could see a line of the ants walking off of a tree or gathering debris from the ground, bringing back vegetation to their elaborate and complex fungal gardens on which they feed." Students observed the traffic patterns of the ant and various behavioral patterns.

The other organism that was studied was the polyandrous walled jacana. To study this bird, the group would go out on motorboats to the study site, which consisted of a patch of floating vegetation on which the jacana lay their eggs. The main goal for their experiment was to capture a female and try to better understand its behavior. When they were unable to do so, they had to alter the traps and cage designs. However, they still couldn't catch one of the birds.

Each night, after a long day in the field, the group would get together at dinner and talk about the day's work. "One of the most important things we did was pool our ideas and thoughts," said Klein. "There were so many people with different backgrounds who offered insight and new approaches to the studies of the organisms," said Klein.

Roland Kays '93, another student who went to Panama, said that both undergraduate and graduate students benefitted immensely from the class. Undergraduates who plan on going into the field of biological research got an idea of what type of research is being done in the neotropics while graduate students were able to get started on their own research.

Kays also said that just as important as the actual research was the hiking and exploring that the group did in the area. "It was important for us to see this part of the world since we are interested in preserving it."
IN A SECLUDED COURTYARD WITHIN the Plant Science building, there is a secret garden.

The secret garden is situated in the southeast wing of Plant Science, hidden behind the conservatory and greenhouses which line Tower Road. One can only access the area by either entering what seems to be a tool shed near Plant Science’s southeast wing, or through an obscure door in the building’s basement.

Once long ago, the secret garden was a haven for hundreds of exotic plant specimens. In 1993 however, having undergone more than 60 years of weathering and neglect, the garden is wilting. Its plants are overgrown and species diversity is rapidly declining. In addition, the walls of the courtyard are cracking, the lintels at the first floor windows are severely rusted and many joints in the garden’s brickwork have opened.

Fortunately, Marcy Porter Sylvester ’82 has been given the unique opportunity to assess the condition of the secret garden and to make recommendations regarding how it can be preserved and properly maintained in the future. The situation is unique because in 1932, it was Sylvester’s own grandfather, the late Professor Joseph Pullman Porter ’17, MLD ’19 who was the original designer and landscaper of the garden.

Professor Joseph Porter, of the Department of Floriculture and Ornamental Horticulture in the College of Agriculture and Life Sciences, was the most active landscape designer on campus throughout his 27-year professorship at Cornell. Besides creating the secret garden in Plant Science, Porter also laid out and designed most of the trails around Beebe Lake and up through the New York State College of Human Ecology, according to Sylvester’s father—Charles Porter ’56. Charles Porter added that his father built ponds, bridges and dams for the old Test Gardens which ran along Fall Creek. He also designed small areas of Stewart and Dewitt Parks and Buttermilk Falls. Now, two generations later, Sylvester is attempting to restore and preserve many areas across the ag campus which her grandfather had originally created.

“The garden is unique in that it lies below ground level and is confined on all sides.”

Professor Joseph Porter who designed the secret garden in 1932.
Joseph Porter frequently used pergolas in his designs. This one is in the secret garden.

Specifically, Sylvester is an architectural preservationist and a graduate of the New York-based R.E.S.T.O.R.E Masonry Preservation Skills Program. Presently, she is working for Wank Adams Slavin Associates (WASA), a New York City-based architecture, engineering and preservation firm, which in conjunction with Sasaki Associates, has been contracted by the College of Agriculture and Life Sciences to perform an in-depth assessment of the conditions of the buildings and sites on the ag quad. These sites include Porter’s secret garden.

Although Sylvester aims to preserve many of her grandfather’s original creations throughout campus, Sylvester said she “hopes Cornell will be able to preserve all of its wonderful gardens.” Sylvester named many sites such as the Cornell Plantations, the Andrew Dickson White gardens and the Minns Garden which she feels “must continue to be maintained because they serve as living laboratories for the plant identification classes, and are loved for both their historical and sentimental significance.”

Sylvester cited her grandfather’s garden as one such site on campus which “deserves preservation attention, specifically because the garden [fosters] an extremely unique growing climate.”

“According to Professor Robert Mower [of the Department of Floriculture and Ornamental Horticulture], said Sylvester, “the garden is unique in that it lies below ground level and is confined on all sides.” This structure allows for a freeze/thaw cycle to warm the courtyard, which in turn allows for an unusually large diversity of flora to thrive there. It would otherwise be impossible for many of the garden’s plantings to grow in the cold Ithaca climate. Professor Mower has cited for instance, that the garden houses English ivy (*Hedera helix*) and the only Albizia (a rare genus) on campus.

Sylvester has already completed her assessment of the condition of the landscaping, as well as her assessment of the interiors and exteriors of the buildings throughout the quad. WASA will soon be recommending appropriate methods of restoration and preservation to the University in June.

Despite the deterioration of parts of the quad, such as the garden designed by her grandfather, Sylvester stressed that the “majority of the ag buildings are actually still in good condition.” She singled out Plant Science and Warren Hall in particular, as two buildings which still “maintain much of their original architectural splendor.” Sylvester added, “It’s outstanding that both buildings still have the original light globes from when they were built.”

Sylvester said she is hopeful that the University will take the necessary steps toward preserving such historical rarities. In this way, she said, the campus can continue to educate and inspire future generations of Cornellians.

Sylvester also said the ag college’s needs for expansion to comply with restrictions imposed by the new Americans with Disabilities Act (ADA) “require creative solutions.” However, Sylvester is confident that “in the future when Cornell is going to make changes, Cornell will maintain its sensitivity to the old buildings and to the old plantings.”

If all goes as planned, the information Sylvester has gathered will be applied to a Master Plan representing the ideal development of the ag campus for the year 2010. Maybe then Sylvester will be able to continue to admire the elaborate and uniquely diverse landscape and architecture throughout the ag campus—and be proud that her own family had a hand not only in its creation, but in its preservation as well.

by Marc A. Merlis ’94

Marcy Sylvester, sitting in a natural environment, similar to the one she wants to preserve at Cornell. She has grown to enjoy these “secret gardens”. She is documenting areas on the ag quad.
ALMOST TEN YEARS AGO SCIENCE teachers Debbie Levin and Ilma Levine of Ithaca had a dream: that students of all ages would have the opportunity to experience the wonderful world of science. Their dream took form when the Sciencenter opened shop in an abandoned downtown Ithaca storefront in 1983.

Their goal was simple—create a nonprofit, community-based organization that would provide exciting hands-on exhibits and continuing educational outreach to the Ithaca community.

And it has worked beyond their wildest dreams. "When we started, we didn't envision it would be as well-received as it has been," Levine explained. "But after a couple of years, we realized there was a lot of demand, and we had to grow."

After moving several times from donated storefront to donated storefront, the Sciencenter has grown so much that its supporters decided it needed a permanent home.

Today, greatly spurred on by the volunteer efforts of Cornell students, faculty and staff, Ithaca's first hands-on science museum, the largest of its kind, is poised to open the doors to a $1 million facility on Route 13 designed by local architects Robert S. Leathers Associates.

"It's not a Cornell organization, but we draw on the resources of Cornell," said Charles H. Trautmann PhD '83, executive director of the Sciencenter and a Cornell research associate in civil and environmental engineering. Many of the museum's more than 2,000 volunteers are somehow affiliated with the University, Trautmann explained.

One of those volunteers is Julie Arnitz '92, a former biology major in the College of Agriculture and Life Sciences who is now pursuing a master's degree in science education. As an undergraduate, Arnitz devoted an entire summer to planning science-related activities for elementary school-aged summer campers.

Arnitz said she would definitely do it all again. "I loved it," she said. "I had the opportunity to work one-on-one with kids of all different ages, personalities and backgrounds."

For younger children, Arnitz focused...
on simple activities, such as the aerodynamics of paper airplanes or the chemistry of making butter. Older campers built bridges with toothpicks and marshmallows and experimented with the various acids and bases commonly found in the kitchen cupboard. All age groups participated in other activities, such as making green slime as a lesson in polymers.

Arnitz praised the Sciencenter's broad-based appeal. "They're really bringing science to the community—getting everyone involved, not just a certain segment of the population."

She added that while planning the activities could be difficult at times, seeing the excitement in the campers' eyes made the experience worthwhile. "It was hard, but it was definitely worth it," she enthusiastically explained.

Other volunteers from the College's Department of Education recall similar experiences. During the fall 1992 semester, several education students fulfilled their field work requirement by teaching the science of sound to third graders at a nearby elementary school.

According to graduate student Cary Capurso, the students worked with the Sciencenter to develop a curriculum for the first part of the semester, then put the theory into practice by visiting the school once a week for the semester's remaining seven weeks. Projects included allowing students to use stethoscopes to listen for their own heartbeats as a lesson in directed sound and making music from glasses filled with varying amounts of water as a lesson in pitch.

"It really was a great experience," Capurso said. "It was a good opportunity to help out the community... It made Cornell look good, too."

Capurso's group was advised by Prof. William S. Carlsen, himself an active volunteer for the Sciencenter. Carlsen, formerly the chairperson and still a member of the museum's Education and Outreach Committee, sees the Sciencenter as an ideal opportunity for his students.

"The way the Sciencenter is set up invites student participation," Carlsen said. In the case of the education department, students can fulfill requirements and earn Cornell credit while furthering the Sciencenter's educational mission. Levine called student volunteers the "backbone" of the Sciencenter's outreach program.

But student participation goes beyond teaching. Department of Communication students have earned credit by putting their skills to work. One class did a "great job" researching and designing the museum's membership brochure, while another developed a three-year public relations plan, Trautmann said.

Students interested in science writing worked to develop a system for writing the signs to explain the museum's exhibits. Assistant Prof. Bruce Lewenstein, who headed the project, said the work "fit every social, personal and professional interest I could find." He added, "Ithaca is my community. I have a six-year-old son who wants to use the Sciencenter, and I wanted to help ensure it would be there for him."

Students in the College of Agriculture and Life Sciences are not the only ones to contribute to the Sciencenter. According to Trautmann, a class in entrepreneurship in the School of Hotel Administration used its skills to raise donations for the museum. In addition, several classes in the College of Engineering have developed exhibits.

The ever-changing nature of the museum makes it easier for all students to become involved in short-term projects. "So much of what students can bring is by definition transient," Carlsen explained. "It is a lot easier for a student to volunteer for two weekends full time rather than every Thursday for two years."

Because the newly-built museum was planned as an expansion of an existing...
Cornellians have been involved with every aspect of the Sciencenter, from knocking down walls to teaching elementary students.”

Cornell students volunteer their time to hammer away toward the completion of the Sciencenter. These students put away the books for the afternoon to help a great cause.

by Dineen Pashoukos '94
Geneva Station Scientists Honored

Three members of Cornell University's New York State Agricultural Experiment Station in Geneva were honored with national awards in December of 1992 by the American Phytopathological Society—a professional society of scientists working on plant diseases.

Herb Aldwinckle, who is the chairman of the plant pathology department at the Geneva Experiment Station, was elected a Fellow of the Society. The honor recognizes outstanding achievement in Aldwinckle's work in plant pathology. At the Geneva Station, Aldwinckle has worked on developing new varieties of apples and apple rootstocks that are resistant to diseases.

Helene Dillard received the Society's Extension Award for excellence in extension plant pathology. Dillard, an associate professor, has concentrated on the control of vegetable diseases as well as biological and ecological concerns.

Wayne Wilcox was awarded the Ciba-Geigy Award for plant pathologists who have made contributions to the study and control of plant diseases. Wilcox, also an associate professor, has worked with diseases in apples, cherries, peaches, strawberries and raspberries.

Jerry Uyemoto, a former member of the Geneva department of plant pathology (from 1968 to 1977), received the Hutchins award for advances in virus diseases of fruit crops. This is the third year in a row that the award has gone to someone who has been affiliated with the Geneva Experiment Station.

New Associate Deans Appointed

Two new associate deans in the College of Agriculture and Life Sciences assumed their positions recently. Brian Chabot became the College's associate dean, while Ronnie Coffman assumed the post of associate dean for research.

Chabot was formerly the director of research in the College of Agriculture and Life Sciences. He replaced Kenneth Wing '54 on December 1, 1992. Wing left Cornell to become the president of Cobleskill Agriculture and Technical College of the State University of New York.

Coffman, a professor of plant breeding and biometry in the college, was also named director of Cornell's Agricultural Experiment Station in Ithaca. The station's major responsibility is to fund programs throughout the University, although it favors the statutory colleges.

Population Program Takes New Direction

The Population and Development Program is under a new director and has new direction.

Douglas Gurak, a professor of rural sociology, became the new director last fall. Since taking over, he has oriented the program's efforts towards sub-Saharan Africa, which Gurak sees as a region with rich cultural and social heritage. Gurak says sub-Saharan Africa is often portrayed by the media as a war-torn, drought-ridden area, but he sees more to it than those broad generalizations.

Previously, the program focused its efforts on Latin America and, to a lesser extent, Asia. But the focus began to shift with the arrival of Gurak and several other population specialists in the 1980s.

Plant Biology Has New Director

The Plant Biology Section of the Division of Biological Sciences has a new director. Peter J. Davies, a professor of plant physiology in the College of Agriculture and Life Sciences, has written several books and has had over 80 articles published in scientific journals. In addition, he is the editor of the professional journal Plant Growth Regulation.

Davies teaches classes on plant functions and plant growth that are geared for horticulture, agriculture and biology students alike. As well as teaching and writing, Davies is currently studying the effects of different hormones on plant growth and stem development.

Davies has had success with his studies in the past; one of his former research projects resulted in a patent on a process that extends the shelf life of tomatoes from an average of four or five days to an average of 10 to 12 days.

First Palm Scientist Chosen

Robert R. Granados, a virologist and director of Plant Protection at the Boyce Thompson Institute for Plant Research, was named the first Charles E. Palm Scientist.

Granados has focused his career on the biological control of insects. Over 90 of his articles have been published, he has edited three books and has delivered upwards of 150 lectures around the world. He is currently researching the ability to control insect pests through the use of viruses.

The endowed position was created with funds provided by the Agway Foundation of Syracuse, N.Y., along with an anonymous gift. The post is named after the former dean of the College of Agriculture and Life Sciences. Palm currently serves as an adviser to the institute's current president, Ralph W. F. Hardy.
ISAAC P. ROBERTS HALL HAS LEFT quite a mark on the history of the ag quad. Roberts Hall was first built in 1904 along Tower Road at the southern end of the quad. The building was a site of education, inspiration and beauty to Cornellians across campus. Then in 1990, as the College faced the pressures of increasing needs for expansion, Roberts Hall was torn down, leaving a huge open space on the quad where the building once stood. Meanwhile the old Roberts Hall was replaced by the new one—this time along Garden Avenue on the west side of the quad. The new building in the new location, along with adjacent Kennedy Hall, now provides space for administration, landscape architecture, communication and education classes and offices. Roberts Hall still maintains a grandeur from years ago.

Landsapers digging holes to plant trees behind the auditorium of Roberts Hall, circa 1904.

Roberts Reincarnate

Roberts Hall as it stands today. The new Roberts Hall stands along Garden Avenue at the western end of the quad.

All that was left of Roberts Hall after the initial stages of tearing down the building in 1990.
On the Farm
About the Issue

The College of Agriculture and Life Sciences was originally founded to help bring the latest technology to New York state farmers. In this issue, the Countryman takes a look at the farm, past and present, and what Cornell has done to help with technological advances in the farming process. First, we'll study changes in apple farming techniques, following one family as it runs an orchard over three generations. Next, we'll examine the latest advances in pest control, Integrated Pest Management (IPM). We'll also look at the plight of migrant farm workers, and study the evolution of the dairy industry. Then, we'll see how the latest technology allows farmers to detect bruised produce quickly and easily. Finally, we'll learn about futures trading, the newest way to invest in agricultural crops.

Note:

Daniel W. Simon '93 served as photo editor for the January/February 1993 issue.
FIFTY YEARS AGO, APPLE FARMING was an unpredictable endeavor. Large overshadowing trees would be grown from grafts on rootstock, taking ten or more years before producing usable fruit. Tall ladders were necessary for harvesting, and fruit quality was variable. Because the trees took up so much space, farmers often grazed sheep on the grasses surrounding the trees to supplement their income. About 600 bushels of apples per acre was considered a good yield.

Today’s apple orchard looks almost nothing like its counterpart a half-century ago. Dwarf-style trees, though also built by grafting onto rootstock, yield sizable fruit in a mere two or three years. The compact trees can be planted in greater numbers than their old-time counterparts, and produce better quality fruit in a smaller space. Harvesting no longer requires large ladders, which considerably reduces labor involved, and hence, reduces costs. And in a good year, the farmer can count on a yield of about 1,000–2,000 bushels per acre, almost double that of years ago. Today, thanks in large part to agricultural advances developed at Cornell, New York state is second only to Washington in its apple production.

The Nicholson family has witnessed this change. Since 1959, their Red Jacket Orchards in Geneva, N.Y. have been transformed from an old-style 90 acre farm to a technologically advanced operation employing 30 to 50 workers and spanning more than 340 acres, with room to expand in the coming years.

“Today, you almost need a PhD to be an apple farmer,” explained Mark Nicholson ’94. “The stereotype that farmers are stupid yokels is absolutely false — you need to understand economics, genetics and chemistry in order to survive in the apple business.” A pomology major in the College of Agriculture and Life Sciences, Mark is at Cornell to learn the latest advances in fruit science. His identical twin brother, Brian Nicholson ’94, is an agricultural economics major here. If they decide to return to Red Jacket Orchards after graduation, they hope their Cornell education will help them lead the farm into the 21st Century.

The pair, along with an older brother and a younger sister, would be the third generation of Nicholsons to tend apple orchards. Their father, Joseph J. Nicholson, Jr., began learning his farming skills in 1959 when his family moved to Geneva from Long Island.

“It was fascinating for me, a kid from Long Island, to come to upstate New York,” Joseph recalled recently. “I thought fruit farming would be the gentleman’s way to farm — plant a few trees, spend the winters in Florida. But it’s heavily involved on a year-round basis.”

In fact, Joseph did not always plan on following in his father’s footsteps. After

This photo shows a small portion of the Nicholsons’ land at the Nicholsons’ Farms store in Geneva, N.Y.

Cornell's experiment station helps the Nicholsons stay on top of the latest technology.
An Apple a Day Made Just Your Way

An Apple a Day Made Just Your Way

This sign welcomes shoppers to the Nicholsons' Farms store.

Joseph Nicholson Jr. shows off some of the fruits of his labor. He is in the area where apples are sorted before they are put in boxes.

receiving a bachelors degree in economics from Villanova University, he went to work on Wall Street. He grew to dislike the New York City hassle, and decided to return to Red Jacket.

"Life's journey is funny. You think when you're a student you know you want to do something and it turns out to not be what you expected," he said, explaining his decision to return to Geneva. "I don't think, for me, there is anything more rewarding than managing Red Jacket."

Now, Joseph hopes some of his children will follow in his footsteps and take over Red Jacket when it is his turn to retire—but he makes a conscious effort not to force them into the role. "I don't want someone here who doesn't want to be here," he explained. "Above all, I want my children to be happy, and for some that might be an off-farm career."

Joseph said he tries to follow a Japanese philosophy of family businesses. "You send them [his children] out to get the best education they can, and to work for the best," he said. "Then if they come back, they are very prepared to run a top-notch business."

He admits that being your children's boss as well as their father can be difficult at times. "Superimposing different relationships on each other can be very stressful," he said. "But it can be very beautiful, too."

And he jokes that even if his children decide against returning to Red Jacket, he can sell the farm for a large profit and become a world traveler. "I've always dreamed of having a passport with every country in the world stamped on it."

While Joseph has not yet realized his dream of traveling the world, his apples have. The Nicholson farm ships 14 different varieties of apples all over the world, including large markets in South America and Europe. Apples are also trucked all over the United States, and a small portion is sold fresh at his on-site store. In all, Red Jacket ships about 120,000 bushels of apples each year, totalling more than $2 million in sales. While that large figure is somewhat deceiving—Joseph said most of the money generated from sales is reinvested into equipment and personnel—it reflects the scale of this "medium sized" orchard.

Joseph credits Cornell's Geneva Experiment Station with much of the advances that have allowed his orchard to grow. "Cornell research and training have been invaluable to the agricultural industry in this state," he said. "They help us be profitable, competitive and environmentally friendly."

For example, the controlled atmosphere storage process that allows Red Jacket and other orchards to sell fresh-tasting apples year-round was developed at Cornell. The process allows farmers to bring their apples to a "hibernated state" by removing most of the oxygen from the air and storing the fruit at near-freezing temperatures. "We take them right on the edge of survival to ensure crispiness," Joseph explained. Freezing the apples would destroy the tissue structure of the fruit, making it mushy. But storage at room temperature also allows for poor quality apples, as oxygen and rotting agents in the air can break down the apples' flesh.

Cornell scientists have worked since the early 1900s to genetically improve apples. According to Dr. Susan Brown, a scientist and associate professor of horticultural sciences at the Geneva Experiment Station, the main goal of the breed-
An Apple a Day Made Just Your Way

The development of dwarf root stock was one of the most important steps towards modern orchards. The various varieties of apples are grafted onto specially-developed roots, which force the tree to stay small. The old-time, naturally grown large trees were not conducive to producing large numbers of apples. Larger trees were “almost parasitic” on the apples growing near the trunk of the tree, because the shading of the outer leaves did not allow sufficient sunlight to reach fruit growing on the interior.

Harvesting was also more difficult. In old orchards, trees reached heights of up to ten feet, and harvesters had to climb on precarious ladders to recover fruit from the uppermost branches. The dwarf trees, which grow to a maximum height of about four feet, eliminate the need for ladders, making harvesting both safer and quicker, Mark said.

Orchard owners have also taken a much different view of pest control in recent years. In the past, many chemicals were just indiscriminately thrown on the trees — including many we now know to be poisonous, such as arsenate of lead and DDT. Today, apple growers take a less chemically-oriented approach to eliminating bugs and diseases. Through integrated pest management (IPM), chemical use is greatly reduced. IPM entails scouting an orchard for dying trees and ridding the orchard of dead material before insects use it as a breeding site. The IPM techniques allow farmers to monitor pest levels and react to specific problems before they get out of hand instead of the guessing approach of the past. In addition, the chemicals that are used are more sophisticated. “Our goal is to produce superior, high quality fruit with minimal chemical control,” Brown said.

“By reducing and monitoring pesticide usage, we hope to keep our orchard a balanced ecosystem,” Mark explained. Often, too much pesticide use can kill off, in addition to pests, beneficial insects which eat these pests. The result may be a bigger pest problem than the original. But IPM prevents that problem.

“Reducing pesticides is not just better for the environment, it makes economic sense, too,” Mark said. His father echoed the sentiment. “I don’t want to spray my apples any more than I have to; it costs me money,” Joseph said.

The Nicholsons benefit from being located in the same town as the experiment station. Because Cornell’s test orchards are so near the Nicholsons’ farm, Joseph said he can almost count on getting similar results when using new technologies developed at the station.

Because the technology has improved so much, Joseph is more “businessman” than the stereotypical farmer. He concentrates on marketing Red Jacket produce, while working managers tend to the orchards, the retail store and the packing process. But ultimately, Joseph is constantly dealing with people.

A sign tells customers about the store.

“Growing up, I did a lot of it myself,” he said, explaining that he worked in the orchards, sorted and packed fruit, loaded trucks, went on selling trips in the northeast and generally helped out wherever he was needed. “That’s how you learn.”

But while he thoroughly enjoys being in charge now, there are some beautiful days when he would love to just get his hands dirty again. “Sometimes, I wish I was out there myself.”

by Dineen M. Pashoukos ’94
YOU CAN PURCHASE A CUP of ladybeetles for only $10 or 25 million nematodes for $20 or else choose among a wide variety of other beneficial insects depending on your individual needs for pest management.

IPM Laboratories Inc. in Locke, New York provides a variety of products and services in the field of integrated pest management (IPM). Carol Glenister MS ‘82, the owner of IPM Laboratories Inc. stated, “As far as I know we are the only beneficial insect suppliers in New York. There is only one other producer in the northeast.” Integrated pest management utilizes a variety of biological and chemical management practices, which focus on the use of beneficial insects to combat insect pests. Cheryl Francis, manager of IPM Laboratories Inc., described the advantages of using beneficial insects for pest management, “Beneficial insects control pests without harming the environment, humans or animals.” Glenister also emphasized the need for IPM and stated, “We simply must use it.”

Glenister explained that one can effectively control pests through the careful use of chemicals in addition to biological controls. In this way, one can utilize both the natural predators that live off the pest species, and the beneficial bugs introduced through IPM. In the past, people used chemical insecticides to such an extent that they killed the natural predators to the pests they were attempting to eradicate. This eventually made people depend even more on chemical insecticides. Today, to maximize the effectiveness of biological control in IPM, people are instructed to use chemicals that are compatible with the biological programs. In addition, IPM Laboratories Inc. emphasizes a variety of management strategies, such as the accurate identification of pests and the correct timing of biological control measures.

There are some clear benefits to IPM as a means to control insect pests. A catalog produced by IPM Laboratories Inc. stated, “Good IPM practice optimizes use of your resources, minimizes contamination of your environment and that of your neighbors and prolongs the life of available chemicals for pest control by delaying the onset of resistance.”

According to Glenister, it is also unlikely for negative effects to develop from the use of biological control measures. The parasites used in biological control are quite species specific, so they are unlikely to attack non-target organisms. Furthermore, fairly strict federal and state laws govern the transport of insects between states to provide an additional measure of safety.

Glenister explained her start with IPM, “I was determined to do something to help growers use beneficial species.” Glenister described how at first she worked on a wide variety of projects which ranged from participation in gypsy moth formulation trials to pest management in sweet corn, apples and cabbage. “No IPM was being done when we got started; initially we just provided a service,” said Glenister. We would do pest monitoring and make recommendations for a client’s specific needs. These recommendations could range from rotating certain crops to incorporating chemical sprays into a management program.

Glenister’s company started in 1981 as IPM Services with Glenister as the sole employee. Today at IPM Laboratories Inc., there are six employees. Turek Farms in King Ferry New York was Glenister’s first customer for sweet corn pest monitoring in 1981. Some of Glenister’s other early clients included people at Cornell University who in 1985 wanted certain insects for a series of experiments. Kreher’s Poultry Farm was another client that wanted a specific strain of insect for poultry parasite management. From these early customers, IPM Laboratories Inc. has greatly expanded. Today they sell beneficial insects to greenhouses, nurseries, researchers, arborists, and a variety of clients in the different parts of the livestock industry.

Presently, the company serves most of the United States through mail orders for insects. Glenister stated, “We produce and distribute a variety of insects nationwide. Others are produced in other places such as Holland, then we ship them nationwide.” In addition, IPM Laboratories Inc. provides a wide array of consultation services for their clients.

The beneficial insects are used in different pest management programs which include the control of: spider mites, thrips, mealy bug, whitefly, scale, aphids, crown gall fungus gnats and flies in New York state. Twenty-two different insect species are used to control these problems. These species range from Aphidoletes aphidimyza, which according to the IPM Laboratories catalog, “...kill the aphids by biting their knee joints, injecting a paralyzing toxin and sucking out their body contents, ...” to beneficial nematodes which attack a more diverse group of insects in a less dramatic fashion.

As the IPM industry becomes more comprehensive, the field is expected to expand rapidly. Glenister commented on the increase of IPM use nationwide. “Even the big chemical companies today are moving towards the use of beneficial insects. IPM use of beneficial species is going to skyrocket.”

by Daniel W. Simon '93
WHAT IS THE INTERNATIONAL SCIENTIFIC community? Upon facing this question for the first time one could make the mistake of answering “the nations of the world and the science that they do.” The idea of an international scientific community seems to indicate that all nations participate in its studies and are affected by decisions drawn from those studies. Though this is in fact what the term “scientific community” implies, there is a great deal more involved than simply the science of all nations—and a great deal less.

Of particular concern to the international community are problems of an environmental and hence global nature. Even the Earth Summit of 1992, which was supposed to represent international views on how to deal with our ailing planet, crumbled in the face of reality. The uneven distribution of wealth within our global community fosters a lopsidedness of influence within the community. This factor affects decision-making pertinent to almost any issue. Only the “G-7” countries, as the major industrial nations of the world are now called, have the resources and technical capabilities to conduct research pertinent to today’s problems. Thus, the international community is more of an elitist club; a few members decide policy while the rest sit idly, hoping to contribute, but not able to for lack of resources. As Professor Sheila Jasanoff of the Department of Science and Technology Studies said, “Science is not, in that sense, universal.”

According to Jasanoff, “The countries that were heavily represented (in the Earth Summit) have a long history of meteorological research.” These nations approach and conduct research in strikingly different manners. Different angles that researchers take affect all areas of study including the subjects actually studied, the degree to which they are studied and the conclusions drawn from research.

This disparity can be highlighted in an example dealing with two nations that are often perceived as similar. The United States and Great Britain approach issues of scientific import quite differently, a result of the degree to which each nation holds its scientists under public scrutiny. In the United States (where accountability to the public is extremely important) it is, as Jasanoff stated, “… always legitimate to ask for more studies.”

What American scientists try to do is reduce any causal relationship to the most fundamental level. Only after all details of a problem are understood will action be taken—a position with which it is difficult to argue. In response to a scientific issue, experts are rounded up and asked to serve on governmental committees. This close-knit relationship between government and research integrates science with policy. As stated by Assistant Professor Bruce Lewenstein of the Department of Communication, “Science is viewed in the United States as objective knowledge that you put in at a specific point in the policy process.” In essence, although good research is conducted, the results of that research are not implemented in action as quickly as possible.

In contrast, Great Britain’s strategy in tackling scientific problems is a more “seat of the pants” approach. Expert judgment in Europe is less in the open, less in the public eye. Stated Jasanoff, research is “sheltered from the public view.” Some-what freed from answering to the public, European researchers are able to draw conclusions much more quickly than their American counterparts. Evidence of this disparity can be seen in the countries’ different approaches to lead contamination. Scientists in the United States continued to research the effect of lead on humans even though definitive data were hard to generate and the issue was highly controversial. The British limited lead sources with little conflict or controversy.

This is not to say that either approach is better, for it is difficult to argue that speed is better than accuracy. Speed of action is often crucial in dealing with environmental problems; something must be done quickly. Accuracy is also an undoubted necessity; one cannot fix what one does not understand.

Perhaps the scientific community can best be understood by picturing the Earth as a family car broken down by the side of the road. Dad and Grandpa (the “G-7” nations) are the only two with any idea of how to go about fixing it, but the two argue as to the nature of the problem. As they discuss their predicament, the rest of the family watches and hopes that Dad and Grandpa know what they’re doing. ■

by E. Kurt Lienau '95
Meeting the Needs of MIGRANT WORKERS

Farms are synonymous with American culture. When we picture farms, we often see images of historic barns quietly overlooking rolling hills, orchards of fruits and vegetables and the black-and-white Holsteins that are truly an emblem of the American farm. What is often missing from our images are the thousands of migrant workers who comprise an intricate part of the New York state farming industry. Herbert Engman, director of the Cornell Migrant Program, said migrant workers have been “absolutely essential” to the farming industry for many years.

Still, it is surprising that many people are unaware of the existence of migrant farm workers. Others who do know about them are uninformed about the contributions they make to farming, New York’s biggest industry.

We owe a great deal to migrant workers. Migrant workers are involved in the harvesting of many crops grown in New York state, especially those for the fresh market. If it were not for their hard work and commitment, we would not enjoy the low prices and the great taste of the many fruits and vegetables we consume on a daily basis. However, more is known about the amounts and varieties of apples produced in New York each year than is known about the people who work long arduous hours to pick them.

Migrants are not only isolated from society by the geographical location of their camps, but also by the lack of attention and respect they have received. The total number of migrant workers, for example, is virtually unknown; some sources claim that there are only 7,500 migrants in New York while others claim that there are up to 95,000. Engman, who has been involved with the migrant program for over 20 years, said that 25,000 is a closer estimate. Engman stressed that “human capital” is unfortunately not a priority in New York.

This ignorance and lack of information concerning migrant workers has caused a vast number of problems concerning migrant workers. Engman said, “Although 70 percent of migrants are American citizens who provide a backbone upon which much of agriculture depends, migrant workers do not have the same basic rights as other working citizens.” The differences were detailed in a 1991 Cornell study requested by Governor Mario Cuomo, entitled, “Agricultural Labor Markets in New York State, and Implications for Labor Policy.” He added, despite having a general reputation in New York state for using vast amounts of social services, migrant workers utilize very little of our tax money.
They in fact contribute more that $92 million to New York's economy alone; they perform arduous physical labor rather than become public burdens, yet they often remain unserved by public agencies.

In addition to their unstable, "follow-the-crops" occupation which keeps migrants and their families constantly on the move, the migrant population is also faced with other burdens such as prejudice and discrimination. Growers, for example, sometimes categorize Latino and Haitian workers as illegal immigrants and do not employ them. Due to the lack of information on immigration laws, and the legal and financial ramifications of employing illegal aliens, many growers are skeptical in hiring Latino migrant workers. In such cases both the migrant and the grower suffer—the migrant has difficulty in finding work and the grower loses a committed employee.

These problems are only the tip of the iceberg. Engman stressed that migrant workers also suffer from numerous health, economic and educational problems.

The Cornell Migrant Program, founded in 1971, seeks to help migrant farm workers throughout New York state improve the quality of their lives. The program is unique in that it is the only land grant university-based program which comprehensively addresses the problems and needs of American migrant farm workers. The program is a joint effort of the College of Human Ecology, the College of Agriculture and Life Sciences and Cornell Cooperative Extension that attempts to draw upon the wide variety of research and educational resources that Cornell and New York state offer to support migrant workers. The program focuses on both the migrant individuals and their families, as well as organizations, farmers and decision makers.

In many of its tasks and activities, the program emphasizes parental empowerment for the migrant farm worker. Through outreach programs, demonstrations for parents and workshops, migrant parents learn parenting skills that enable them to better assess the needs of their children, assist their children's development and act as principal educators. Parents are also encouraged to participate on boards and committees which have impact on their community.

The program also attempts to increase the coherence between different agencies, decision makers and the larger community of the migrant labor system. In doing so it emphasizes the system's effects on migrants, their families and the farm industry.

Information about farm labor management and regulations, multi-culturalism and racism is provided to the aforemen-

diligently working for over 20 years to combat ignorance and discrimination, migrant workers are still challenged and discriminated against—additional services similar to the Cornell Migrant Program need to be implemented as soon as possible. In this way, New York state residents can continue to enjoy the delicious fruits and vegetables that migrant workers across the state have had a hand in harvesting.

by Antonio Belen Santana '93
George Hudler:

“WELCOME TO THE MUSHROOM show. Have a seat. Ready, set, go!” Though these words seem to be straight out of some fantastical Lewis Carroll story, they actually were uttered in a class here at Cornell. These are the words which Associate Professor George W. Hudler used to open lecture on the first day of Plant Pathology 201. Plant Pathology 201—you know—“Magical Mushrooms, Mischievous Molds.”

Obviously enough, Hudler is not your run-of-the-mill lecturer. According to Amy Lake ’94, one of Hudler’s students, his dynamic opening statement is just one example of the enthusiasm that Hudler brings to each of his lectures. With his quick wit, action-packed lectures and unique passion for “our fungal friends,” Hudler is rapidly reaching superpopularity status among ag students.

Hudler said that his passion for plant pathology was first sparked in 1969 during his senior year at the University of Minnesota. “It was merely the case of a professor who caught my attention,” Hudler recalled. “The professor was discussing the dangerous effects of eating peanuts which were infected with mycotoxins [toxic chemicals produced by fungi], and I was so moved that I knew my future would lie in plant pathology.”

Evidently, Hudler’s hunch was correct. In 1970, he received a BS degree in forest resource development at the University of Minnesota, and then continued there to receive his MS degree in plant pathology in 1973. Hudler then enrolled at Colorado State University and was awarded a PhD degree in plant pathology in 1976.

Only two years later, in 1978, Hudler was officially appointed to the faculty at Cornell University. Presently, Hudler’s title is associate professor in the Department of Plant Pathology in the New York State College of Agriculture and Life Sciences. He specializes in diseases of forest and shade trees.

As an associate professor, Hudler said his duties entail 20 percent research, 30 percent extension work and 50 percent teaching, “though the first two areas overlap somewhat.”

In the research field specifically, Hudler said the brunt of his time is dedicated to work on maple trees. “In particular,” Hudler said, “I have been studying the effect of environmental stress on predisposing maples to disease.” He explained that maples which grow in forests often are not affected by the same diseases as are maples which grow in people’s yards. His research is aimed at developing an explanation for this observation. Hudler suspects that certain stresses—such as drought and defoliation, which affect yard maples more than forest maples—most likely cause this difference.

Another group of maple problems which has attracted Hudler’s attention includes leaf diseases known as tar spots. Tar spots on red, silver and Norway maples are supposedly caused by a sole species of fungus. However, Hudler said he is certain that at least two species are involved and is pushing for a change in the plant disease literature. The disease was apparently introduced from Europe and poses a threat to Norway maples throughout the northeast.

According to Peter Mullin, the Coordinator of Laboratory Instruction for the plant pathology department, in addition to his work with maples, Hudler also shows dedication in his extension work with diseased Christmas trees. Hudler explained, “Pines throughout much of northeastern New York state may be attacked by a fungus named Ascocalyx abietina. The fungus causes sclerotinia canker, a disease whose trademark is leaving Christmas trees with dead branch tips. Severely infected trees may be killed. When winter comes and the trees are shipped to other parts of the state or
A Really **FUNGI**

country, Hudler continued, the disease may be spread with the shipments.

But over the past three years, Hudler has taken steps to combat the fungus and other Christmas tree pests. First of all, twice during the spring and summer Hudler publishes the “Christmas Tree Integrated Pest Management (IPM) Newsletter.” Hudler said the newsletter is aimed at letting growers across New York state know exactly when to look for insects and diseases and how to combat them. The newsletter also provides guidelines for safe and effective pesticide and fungicide use. Hudler added that he has also put a “major effort into searching for, and propagating Christmas trees believed to be resistant to various pests.” In time, he hopes, the fruits of his labors will be “planted” throughout the northeast.

Although these research accomplishments are impressive, Hudler has also made marked accomplishments in teaching, according to Rosa Corral, one of Hudler’s teaching assistants. In 1992, Hudler was awarded the Excellence in Teaching Award from the American Phytopathological Society. In addition, hundreds of Cornell students taking “Magical Mushrooms, Mischievous Molds” rated Hudler as “outstanding,” awarding him an overall score of 4.8 out of 5.0 on teacher evaluation forms.

Currently, Hudler teaches three courses at Cornell—“Pathology of Trees and Shrubs,” “Plant Disease Diagnosis” and the celebrated “Magical Mushrooms, Mischievous Molds.” Each course has received enthusiastic responses from ag students across campus. Brenda White ‘94 said, for example, “Magical Mushrooms is taught with such heartfelt enthusiasm that when I walk into that lecture hall, I am glued to Professor Hudler from start to finish.” Mary Kate Conroy ‘94 said, “Ag students would be making a huge mistake to graduate and not have taken Mushrooms.”

When asked to reflect on the overwhelming popularity he has achieved, Hudler simply responded, “I’m flattered.” He said he is “just thankful for the opportunity to get to know more students on a personal level.”

Corral echoed these sentiments. “Hudler truly wants to establish a personal relationship with his students,” she said. “That’s why each year he holds a fungus feast where his students actually get to eat prepared fungi. He is dedicated to bringing the coursework, laughter and theater all into one.”

Hudler’s colleague, Professor Phil Arneson of the plant pathology department, agreed. “George Hudler shows genuine and sincere interest in his students,” Arneson said. “He even attends some of his students’ swim meets and volleyball games just to get to know another part of their lives.”

As for plans for the future, Hudler is certainly going to continue teaching “Magical Mushrooms, Mischievous Molds.” He also said he is hoping to develop a Freshman Writing Seminar course in the plant pathology department within the next two years. He said he is “playing around” with possible angles for the course, though he is certain that he wants to include pesticide misuse and genetic engineering.

“All too often our knowledge about the environment comes from newspapers and magazines where the topics are dealt with too superficially,” Hudler said. “I want my students to be able to fully appreciate the complex nature of the problem.”

The only problem that students see, however, is that Hudler did not develop his freshman seminar course sooner. Too many generations of Cornellians have already missed out on the knowledge, laughter and inspiration that the “magical mushroom man” brings to the Cornell campus each day.

by Marc A. Merlis ‘94
IN 1855, TWELVE YEARS BEFORE Cornell was founded, a small group of men got together and built a covered bridge. They built it in a town outside of Ithaca, N.Y. called Newfield. A local carpenter named Samuel Hamm, his two sons David and Sylvester and four other men erected the bridge. When they were finished, it spanned 115 feet across a creek between Bank Street and Main Street in Newfield.

One hundred and forty years later, two Cornell students have conducted what may be the first engineering studies of the bridge. In spring 1992, Kevin Maki '93 and Garth Riley grad were members of the course “Design of Wood Structures” in the Department of Agricultural and Biological Engineering. For one assignment, the students, who were taught by Associate Professor Kifle Gebremedhin, were required to analyze or design a wooden structure. “Since I grew up in Newfield,” said Maki “I thought about studying the Newfield covered bridge. After snooping around, I found that there had not been any real analysis done on the bridge.”

Soon the two students were in Newfield working on the project. First they took pictures of the structure. Then they measured it. “We needed measurements because there were no measurements taken before,” said Maki. Both Maki and Riley crawled underneath the bridge, on the road deck and even up into the roof to get their measurements.

The bridge that Maki and Riley studied differs slightly from the original. According to Marie and Grant Musser, keepers of the bridge for the past 17 years, the bridge was restored in the early 1970s. “The county wanted to tear the bridge down and build a steel and concrete bridge,” said Marie Musser. “We fought it and got the county to restore it.” Marie Musser added that the original cost of the bridge in 1853 was $800 while the restoration cost was $42,000.

There were several changes that took place during the restoration of the bridge. The portal entrance was raised two feet so that cars would have enough clearance. The entire bridge was raised one foot. This was done because during rainstorms, water from the street would flow into the bridge, causing the wood to rot, and thus defeating the purpose of the roof. The other major structural change was the addition of two arches running parallel along each side of the bridge.

The Newfield covered bridge was constructed in 1853, at a cost of $800.
These were added for support, not only for the weight of cars, but also to support the bridge’s own weight.

Maki and Riley concentrated on analyzing the old bridge. “After we took measurements, we used computer programs to analyze the structure because of its size,” said Riley. “We could have analyzed the bridge by hand, that is with a pencil and a calculator, but that would have taken forever.”

According to Maki, however, computers were not able to help as much as the two would have liked. “We found that commercial software was unable to analyze something that was built so long ago,” Maki said. “The sizes of the various pieces of wood used, for example, were not similar to any that are used in structures built today.”

In their analysis, the two students also tried to use engineering charts to determine the amounts of stress placed on the bridge’s wood at several locations. However, they found that these standards were not applicable to the Newfield covered bridge, mainly because the bridge was not designed by engineers. “We were limited in our analysis techniques as engineers,” Maki said.

Despite the difficulties they encountered, Maki and Riley were able to determine that the original bridge, without the supporting arches, would be able to support most of the weight that could conceivably be put on it today. According to Maki, the report, which was completed in April 1992, contains only a small amount of the possible information that could be assessed from the bridge. All that was included was a rough measure of how much weight the bridge could support. Still, Maki and Riley feel they have done something that may help out future restorers of the bridge.

Copies of the students’ report are on file with Gebremedhin and with the keepers of the bridge. “We hope that our information will be useful to someone doing work on the bridge at a later date,” said Maki.

“As far as we know,” said Riley, “what we did has never been done before.” There is no record of these old bridges because they were all built by rules of thumb and techniques that were passed down through generations.

Riley added, “It was interesting for us to bring an old work into the future by scientifically analyzing it, and in doing so, trying to preserve a part of history.”
The dairy industry today depends less on relatively small "family farms"; instead it utilizes larger, more technically advanced dairy operations.

The farmers of the United States constitute only about four percent of the entire population. This four percent of the population feeds the rest of our country and other countries as well. In 1990, U.S. dairy farmers produced $20,483,373,000 worth of milk. (USDA Agricultural Statistics, 1991.)

About 50 years ago the typical dairy farmer would milk about 20 cows twice a day. Farmsteads, in those days, were self-sufficient and diverse in their livestock. They had pigs, sheep, chickens and goats. Farmers also grew some grain crops, such as wheat, barley and oats. Flour and sugar were the only staples that the farmers purchased. Farming was a way of life. Surplus milk and grains were all that were sold. Milk was hard to keep cold and difficult to transport.

Today the dairy industry is becoming more specialized and more business oriented. The majority of dairy farms are still small family-run businesses, but as the technology changes and the population increases the dairy industry must change to meet the future. Mike Bargabos owns Eagle Rock Dairy, an 1,150 cow dairy located in Canastoga, New York.

Seven hundred of his stock are mature milking cows, the rest are calves and heifers. "The dairy industry is exciting," said Bargabos, "Lots of changes are coming, and there is lots of technology that has not been applied yet."

Bargabos, who had originally been involved in the contracting business, purchased his farm in May 1989. The farm has two large free stall barns which accommodate 1,000 cows, and a milking parlor that is capable of milking 36 cows at a time. Eagle Rock Dairy is very automated in comparison to the average smaller dairy farm. Each cow wears a transponder which is like a computerized name tag. When the cow enters the milking parlor to be milked a built-in computer system picks up the cow's transponder code and automatically records the cow's milk production.

The cows at Eagle Rock Dairy are milked three times a day, which constitutes about 20 hours of milking per day. "Milking three times a day means that there is less of a chance that a cow will be overlooked," said Bargabos.

What are some differences between a large dairy and a smaller dairy? "For one thing there is a lot more paperwork," explained Bargabos. "Our farm is very business orientated. We have 23 full and part-time employees, equivalent to about 11 full-time positions. We have people scheduled around the clock. It's kind of like a McDonald's, My family doesn't have a whole lot of privacy," concluded Bargabos.

To run such a large operation efficiently, Bargabos has hired many consultants. David Stockwell '80, a Cornell veterinary college graduate, works on Eagle Rock Dairy's "production medicine." "About one-third of my time I spend working on nutrition and production-related matters. I evaluate the herd and decide what each cow should be fed based on her production," said Stockwell. Since Bargabos buys all of his feed, his initial investment is reduced; he does not put money into buying seed and paying people to plant and grow crops. He has more flexibility. He can decide exactly what he wants to buy to feed his cows. Additionally, he has more time and can concentrate on managing the dairy. "The second third of my time is spent advising on the health of calves and cows. The
Dairy Industry

computer system can help determine a health problem. If a cow suddenly drops off in her milk production we know to look for a health problem," said Stockwell. The last third of his time Stockwell spends on monitoring herd health and reproduction—especially by checking when the cows are ready to be impregnated.

South of Ithaca, N.Y., about 15 miles over the New York-Pennsylvania border, the home of the Elliott dairy farm stands on Ghent Hill. Tom Elliott grew up on his parents' dairy farm and is now a dairy

farmer himself. The Elliott farm has about 130 cattle altogether, 50 of which are mature milking cows.

Elliott's typical day starts at about 6:00 am when he goes out to the barn and does milking, feeds all of the stock, and cleans the barn. "You must always figure in a certain amount of time to spend fixing something that breaks," said Elliott. During most of the year the middle of the day is dedicated to doing field work such as plowing, planting corn, oats and soybean, raking and mowing hay. During the winter, the middle of the day is spent fixing machinery and preparing for the spring. In the evening, the chores of the morning are repeated again.

"Dairy farming is a way of life that has to be looked at from a business point of view," said Elliott. "Although it is easy to get fond of the cows, you have to look at what a cow is, not at what she was. You can't afford to be sentimental. You must be business-minded," he concluded.

Although the price of milk production has increased tremendously, the price of milk has stayed the same, with slight fluctuations, over the past 12 years. $12 per hundredweight of milk, which roughly equals $1 per gallon. Milk pricing is partially determined by federal planning and regulations. "Farmers have been forced to produce a hundred pounds of milk more efficiently than they used to," said Elliott. "To be successful you have to be smart as well as work hard," advised Elliott, "You have to make good decisions. And there is no time that you should not be prudent." Where will smaller dairy farms fit in the future dairy industry? David M. Galton, an associate professor in the Department of Animal Science, thinks that "Although the number of small dairies will decrease in the future, they will still be a vital part of the dairy industry. However, they will have to increase their productivity and efficiency." In order for small farms to maintain a viable business Galton advised that they practice excellent cost control, maintain low, if any, debt, have high production, maintain low capital investments, diversify farm enterprises such as registered cattle and consider ways of making non-farm income.

Galton also is a member of the Cornell Cooperative Extension, through which he has direct contact with the dairy farmers of New York state. Of the farms that he has visited is Eagle Rock Dairy. "Larger dairies have advantages because of their size," said Galton. They have greater financial flexibility, reduced fixed costs per cow and greater flexibility for the family (Bargabos can get away for a weekend because his staff can run things while he is gone.) Larger dairy farms have increased labor and productivity efficiency, provided that the management works well.

"I think that the dairy industry will become highly specialized. Farmers will split off into different factions. Some will grow feed, some will raise heifers and some will just milk cows," Bargabos said. Stockwell thinks that "The transitions will happen slowly as they have for the last 12 to 15 years. Changes will definitely be gradual." Elliott's opinion is that "The number of farms will decrease. Dairy farms will become bigger and will be run more efficiently."

A dairy enterprise requires a high initial capital investment. A farmer must pay for land, equipment, facilities and cows, not to mention the general cost of living. The days are long and filled with hard work. Money must be tightly managed. "You have to make sure all your numbers work," said Bargabos. But despite all the hard work and responsibility of the dairy business, it is still a way of life. "I can't think of anything else I'd rather do," affirmed Bargabos. 

by Mary Kate Conroy '94
THE APPLE INDUSTRY IS THE THIRD largest fruit industry in the United States. Mechanically detecting defects, like bruises on apples, would provide consumers and producers with many benefits. At Cornell University, a computer vision system is being researched and tested that could provide a means of bruise detection.

**Background**

Automation in the agricultural industry has led to many technological advances in the area of fruit harvesting. The use of mechanization has simplified the harvesting process and has reduced harvesting time. Trunk shaking and impacting devices have proven successful, but they have also increased surface damage and bruises beneath the skin's surface. Jim Throop, a research specialist at Cornell, said, "Image processing works for other defects, but bruises are the hardest to detect." Throop, Daniel Aneshansley, an associate professor in the Department of Biological Engineering, Gerald Rehkugler, associate dean of engineering for undergraduate programs and Bruce Upchurch, a USDA scientist, are all involved with the research in this area.

Over the past twenty years ongoing research has been done on an automated computer vision system. Near infrared reflectance, those invisible rays just beyond the red end of the visible spectrum, are used to detect bruises in apples. In 1982 Gerald Graf, a graduate student at Cornell, worked on a successful image processing system. He was able to detect bruises with accuracies as high as those of human graders. A big problem, though, was the system's processing time. It took two minutes to process a view of one side of the apple. Research then was aimed at how to produce an image of the entire surface of an apple. Aneshansley said, "We have been working on ways to continually upgrade the analyzing techniques of the images produced by this system."

**Hardware**

There are four essential pieces of equipment needed for this system to function. One is the camera and the others are the computer, the mechanical system for handling the apple and the light system. The earlier system, which was worked on by Graf, relied on a matrix camera to derive the images. Throop noted, though, that there were some disadvantages to that type of camera. "The matrix camera gives a geometric distortion of curved surfaces, thus the bruises were distorted horizontally and vertically." After careful research, a change was made from the matrix camera to a line scan digital camera. Throop stated, "This camera [the line scan] eliminated size distortion, producing a true image of the bruise." He stated, though, that there was one disadvantage to the line scan camera. He noted that the camera is triggered for every line of the image taken. The movement of the
This system is a big improvement over human graders.

Apple is fundamental to the creation of the image of the apple. Therefore it is critical that the camera and the apple movement be synchronized. A special diffused lamp is used within the camera apparatus to produce the right image in the camera’s view.

To implement such a bruise detection system, obviously enough, it is important that the system be able to distinguish between bruised and unbruised tissue. The image system accomplishes this using diffused reflectance. It was found that the reflectance of bruised tissue in apples significantly decreased in the near infrared radiation. Thus, by using near infrared radiation to find areas of decreased reflectance, the system can identify areas of bruising.

The computer fits into the bruise-detection scheme by synchronizing the apple with the camera. Throop said, “The computer controls the mechanical system that turns the apple so successive rows of pixel values can be built up by the line scan camera to form a complete image of the apple.” The end result yields an image of the entire surface of the skin of the apple.

The computer system then takes the successive images through a sequence of processes. An algorithm is used for processing gray level images of the apple’s surface from the line scan camera. A binary image is then formed by further processing with black pixel cluster shapes, showing potential bruises on the apple.

These clusters of black pixels are examined for shape and size and are considered actual bruises if they are nearly circular in shape.

Benefits

One major benefit from this computer vision system, or mechanized bruise detection system, Throop stated, is that of a national uniformity for measuring quality standards in both the fresh market and the processing industry. “If there was a fixed quality measuring standard system then there could be a uniform pricing system established.”

Another advantage is the removal of human variability in the sorting process. Aneshansley said, “This system is a big improvement over the human grader. It can detect small bruises with an accuracy of more than 80 percent.” For the processing industry generally 130 apples are randomly pulled off of a truckload and a representative from the USDA grades them manually, deciding the quality of the truckload. He also noted that the high turnover rate of human graders on the sorting lines leads to inexperience and an enormous amount of variability.

There are also many economical benefits for growers and processors. In the processing industry, the computer vision system would allow the redirection of damaged fruit for processing before the entire fruit decays. This system would also allow processors to store fruit and spread out the time needed to process it. Throop stated that value-added products are becoming the growing part of the processing industry. Value-added products such as apple slices, are used by restaurants for plate decoration.

The fresh market demands much higher quality. Since consumers are close to the apples and free to look them over, it is very critical that there are few bruises on them. A fresh market in New York City, selling to gourmet restaurants, wants only the apples with a good exterior, as well as a good interior.

Cost Effectiveness

Aneshansley spoke about the cost effectiveness of the system. “The total system costs of the video equipment are quite expensive but in relation to the money it will generate for growers and processors, I think it is very cost effective.” Over a period of time the system will pay for itself by saving in labor costs and by insuring that those apples with defects are sent for immediate processing, while the undamaged are saved for the fresh markets or for processing plants using them for value-added products.

The Future

The computer vision system as it stands now, could be used only in the processing market. However, because value-added products require stricter methods of bruise detection, it is imperative that a system be able accurately detect defective apples. Growers receive less per apple in the processing market than they do in the fresh market. Aneshansley admitted, though, that “We are not at a point thus far in our research to implement this type of system for use within the fresh market.”

The future for vision computer systems in food processing is looking very promising. The system is still a laboratory prototype Aneshansley stated, yet he and his associates hope it will soon be manufactured for commercial use. Advances in technology have allowed researchers to remedy many of the problems that have arisen with the technology over the past 20 years.

Today manufacturers can produce automated systems that check the color, size and shape of apples. Cornell University’s research on bruise detection may lead to even greater technological advances in the apple industry. Soon the apples will peel themselves.

by Karen Wickham ’94
ONE BLUSTERY DAY IN JANUARY 1993, a Finn-Dorset cross ewe gave birth to six tiny lambs in the peaceful surroundings of the Cornell-owned Mt. Pleasant Sheep Farm in Varna, New York. Most people would shudder at such an astounding figure, but not those who work closely with the sheep at Cornell University. In one lambing alone, several ewes delivered quadruplets and to many triplets and twins were born.

The Mt. Pleasant Sheep Farm was established on October 17, 1903 with the purchase of four purebred Dorset ewes and one ram from Woodland Farms in Ohio, owned by J. E. Wing. The second set of Dorsets, another four ewes and one ram, were purchased in 1906 from H. Pratt of Canadaguia, New York. Sheep had been owned by Cornell prior to 1903, however, the first officially recorded date is unknown.

All of the original registration papers can be found on file in the Department of Animal Science. These papers show that some of the flock today are direct descendants of the first Dorsets that were purchased back in 1903. Today, Cornell proudly owns the oldest Dorset flock in the United States.

John P. Willman, professor of animal husbandry, oversaw the sheep operation as of 1931 and was responsible for teaching and conducting research with the sheep. Walter Thomson was the shepherd prior to 1954 and helped with Willman's research.

G. Lawrence Hunt '34 took over as shepherd from 1954 to 1978. During his time as shepherd he worked a lot with undergraduate students teaching them common sheep husbandry practices.

The purebred flock went through a number of changes in the 1930s. Between eight and fourteen ewes and one ram, each of the Dorset, Hampshire, Merino, Shropshire and Southdown breeds, were purchased in order to expand the flock. In 1941, however, the Merinos and Shropshires were gradually eliminated and Cornedales replaced them.

According to animal science's A History and Record of Development from 1868 to 1963 by Kenneth L. Turk, the animals were originally housed in a barn built in 1931 and in the old original Waite barn. A new building was constructed in 1939 after a fire destroyed the Waite barn. All of the sheep were housed in these two buildings and were used as breeding flocks and for experimental purposes.

In 1938, Cornell took its next step in ovine research. The Kenwood Sheep Farm was established as an experimental operation. Research was conducted there for a ten-year period to determine whether or not sheep production on the typical hilly farm lands of New York state could be profitable.

Dr. Douglas E. Hogue MS '55, PhD '57, a professor in the Department of Animal Science, has overseen the sheep operation from 1957 to the present, and is pleased with some of the changes that have taken place. In 1978, the Teaching and Research Center was built in Harford, New York which now houses primarily Dorsets, Finn sheep, Suffolks and Rambouillet sheep along with two not-so-common breeds. One is the Karakul breed which is a fat-tailed fur breed that has a kinky, black fleece. The other is the Jacob breed which originated in Ireland and has long, spotted hair and can have up to four horns. These two breeds are novelties and add a unique look to the flock.
Sheep at Cornell

The sheep facility at Mt. Pleasant was established in 1988 and researchers there primarily focus on the Finn, Dorset and Finn-Dorset cross breeds. The farm has between 450 and 500 breeding ewes. The Merino, Shropshire, Southdown, Hampshire and Corriedale breeds have since been eliminated from the Cornell sheep program.

Most of the emphasis is placed on the Finn, Dorset and Finn-Dorset cross breeds because Cornell is interested in establishing a schedule of multiple lambings throughout the year. "By getting rid of the other seasonal breeds, we were able to put more emphasis on the Dorsets [which are nonseasonal breeders] as the maternal line," stated Hogue.

In the 1970s, accelerated lambing began and was further enhanced when Brian Magee MS '78 became the sheep farm manager. Magee developed and implemented the STAR system in 1983 which was a major step up for production. Hogue replied, "Brian does not take the credit for developing the STAR system, but I give him all the credit."

The STAR system is a calendar based around a circle with five different points of breeding and lambing times. Each ewe may be bred at every third point around the STAR so that she will lamb approximately five times within a three-year time frame or 1.67 times a year. If a ewe has twins every time she lambs, she will give birth to 3.33 lambs each year. The United States national average for number of births per ewe per year is about one lamb. However the ewes at Mt. Pleasant are averaging nearly three lambs per ewe per year.

Before this system was created, the Cornell Alternate Month Accelerated Lambing system, better known as CAMAL, was used, allowing for six lambing schedules per year. Cornell used this system for five years along with other alternative lambing systems which allowed for three to four lambings during a one year time frame. These all required a great deal of time and management so the STAR system was developed and enabled those working closely with the ewes to have a less demanding lambing schedule.

Production has been a success since the development of the STAR system. Hogue has been well pleased with the results, especially with the Finn-Dorset cross because these sheep have demonstrated a quality of lambing that far exceeds the norm.

Another somewhat minor change that has been made over the past few years regards the type of feeds given to the ewes. At the Teaching and Research Center, haycrop silage is the primary source of feed. The animals at Mt. Pleasant are fed big round bales of hay. Lambs are fed a high concentrate diet as they are being weaned and prepared for sale. Choosing these types of basic feeds considers labor efficiency while still maintaining a quality diet for all of the sheep.

Today the sheep are continually being used for research and for educational purposes. Animal Science 380, "Sheep," is a class which is dedicated solely to teaching students about feeding, breeding, management and selection of sheep from a production-system approach. Students also have an opportunity to get hands-on experience at the annual Live-

By Dietre D. Richael '95

"Star System" ewes lamb five times in three years.

At Mt. Pleasant there are approximately 500 ewes. This photograph, taken by John P. Willman, shows the Cornell Dorset flock as it appeared in the 1930s.
FUTURES SHOCK

FARMING. IT'S ALL ABOUT FIELDS, SOIL, crops, barns, animals and tractors. And about computers, brokers, hedging and trading. That's right, what once was a profession characterized by farmers who worked in the fields all day, has been penetrated by the financial wizardry of trading markets just like every other profession has been.

The farmer's "Wall Street" is actually the Chicago Board of Trade. Many major commodities are traded on this market. Farmers can buy and sell futures in Chicago with a phone call, or—on more sophisticated farms — with a simple keystroke on a home computer.

While many investors engage in futures trading in order to make money (which is called "speculating"), farmers can use the futures market to lock in a price before they even plant the crop.

"Usually, when producers make a decision about how much to produce, they will do it at a time when they will not be sure about prices in the future," said Deborah Streeter, assistant professor in the Department of Agricultural Economics. Because of this uncertainty, farmers stand to lose a lot of money if the market does not deliver a high enough price when they decide to sell their goods in the market. Thus, they attempt to prevent price fluctuations from eroding their profits by "hedging."

"The goal of hedging," described Streeter, "is to provide an opportunity for someone who is going to buy or sell a commodity to lock in a price ahead of time." To hedge, a farmer takes a position in the futures market which is the equivalent of the position he will eventually have in the cash market. (For a more detailed discussion, see sidebar.)

However, the system does not work as well as it might seem. Hedgers need strong financial backing because of a limitation called a "margin call."

When people buy a futures contract, they do not need to pay the full cost, just some percentage of it called a "margin." The margin allows hedgers and speculators alike to deal in much higher volumes. However, the action can also lead to disaster. If the market turns against the speculator or hedger, he or she will have to pay margin on the loss. In some instances, this may be hard for hedgers because the capital gain to offset such a loss is not realized until some months later, when the farmer sells the crop.

"Banks should theoretically be willing to pay those [large margin calls]," Streeter said. "You are in a risk management program and it is a business expense that you are incurring. But you may not have bankers who understand or are educated in the futures market, so you may not have the banking backing you need to maintain your position."

In such a situation, a hedger who does not have the capital to continue the hedge may be forced to close the position on the futures market early. And while this loss could be counterbalanced by the rising price of the crop, it also could lead to financial disaster if the price suddenly turns around after the farmer has closed his hedging position.
“Farmers hear horror stories about people who get burned, and it makes them more skittish about getting into the market,” Streeter said.

Chris Henke, of Shearson Lehman Brothers, a national brokerage house, has dealt with farmers who hedge, and has seen the inherent problems with the system. “We do not go out and solicit this type of business,” she said, referring to the potential disaster that could arise from a farmer who cannot back his hedge.

Unlike the stock market, where you buy a share of stock for its cost and the most you can lose is the amount you paid up front, the possibility for loss and gain in the futures market is larger because the margin system allows one to control a large amount of money with a small amount of investment. Also, in the stock market you can hold onto a stock for years while you wait for it to turn a profit, while a futures contract must be bought or sold back within a certain period of time. Waiting until the market turns in your favor is impossible. For these reasons, Henke does not encourage farmers to get involved with hedging unless the farmer knows what he or she is doing.

Henke also said that when farmers do contact her about hedging, “They call the shots. Farmers know which way their markets are going. Most of them who engage in futures trading have more sophisticated computers than we do.”

And the farmer’s desire to maintain control over his or her futures dealings creates yet another logistical problem. “Commodities tie up capital that could be put towards other business uses,” Henke said. “Farmers are out in the field, not at a computer screen.”

Aside from running into logistical problems while hedging, farmers also must fight some tough psychological barriers. “It may be very difficult to maintain a futures position that is in the red,” Streeter explained. “Even though you might say to yourself ‘Okay, my cash market gains are offsetting that,’ you may not feel that way, or your spouse may not feel that way, or your partner may not feel that way.”

“IT’s hard to be objective,” said Cal Snow, a farmer in Brooktondale, N.Y. who was involved in the futures market for a few years. “I couldn’t be.”

But Snow saw more problems with futures trading when classroom theory was applied to the real world with real money. “Everything doesn’t work as well as it’s taught,” he said.

Snow said that while he was involved in futures trading, he witnessed situations where the cash market and the futures market were moving in opposite directions. For instance, the price of corn was rising in the futures market but dropping in the cash market. “The idea was to protect yourself, but you could get doubly screwed,” Snow said.

Although Streeter pointed out that such fluctuations are removed over the long run by the forces of supply and demand, sometimes small farmers cannot afford to play the game over “the long run.”

In fact, when Snow engaged in hedging, he saw the futures price of his grain rise while the cash price declined. And while Snow was dissatisfied with hedging, he said that it did have its place in the agricultural world. “It’s okay for big companies,” Snow explained “because they have the capital to deal with [such fluctuations], and it’s insurance against a
big move.”
One other practical factor that goes against Snow and other central New York farmers when they try to hedge, is location. Prices determined in the futures market reflect the value of the goods in Chicago, quite a distance away from central New York. Theoretically, if New York prices are lower, Snow and other New York farmers’ crops could be shipped to Chicago. However, due to the expense and hassle, few actually ship the goods to the midwest themselves. Rather, they sell to a local distributor (called an “elevator operator”) that ships large quantities of goods to buyers. The shipping costs and the profit margin of the elevator play a role in the price they can pay producers, so New York farmers often receive a price quite different than the futures price.
Sometimes, the difference makes it even tougher to hedge. Nonetheless, a quick glimpse at the exchange in Chicago will tell you that plenty of speculators and hedgers are willing to engage in futures trading. Looking beyond all practical and theoretical problems, these people are hoping to use simple economic factors to make money on the price fluctuations on certain commodities.

Theoretically, producers can lock in prices for their crops long before they take their goods to the market.

Farmers and other commodity producers often must make decisions about how much crop to plant, long before the value of a crop can even be determined. This can be very risky for farmers, as sometimes the price may drop so low by the time the produce is ready to be sold, that the crop is hardly worth the cost of production.
Producers can avoid having their profits eroded by price changes by “hedging” in the futures market. When outsiders look at the futures market, they see a whole lot of people trading money over nothing. Very few people who enter the futures market take delivery on the commodities they buy in the market because they turn around and sell them back before the delivery date of the commodity. Conversely, people who agree to sell commodities on the futures market eventually buy their produce back before the delivery date.
This market system allows anybody to enter into the market. Speculators sell corn just like producers do, and then turn around and buy it back with the hope that the price will go down and they will make a profit. Such profit-seekers are called “speculators” because they try to make money by speculating in which direction prices will go, and then selling or buying accordingly (they try to buy when prices are low and sell when they are high).

Hedgers use the same principle as speculators, but they are less interested in which direction the commodity price will go. If the producer plans to sell a certain amount of corn on the open market in the upcoming months, he may hedge against a bad price by selling corn to the futures market now. When that producer is ready to actually sell his corn, he will buy that futures contract back. That way, if the price of corn goes down, he has made money in the futures market (remember: he bought low and sold high) to counterbalance a loss of money due to the devalued corn.
Even if the futures market does not go in the producer’s favor (the price goes up after he sold the corn futures), the unexpected increase in value of his corn will counterbalance the loss in the futures market.
Essentially, when a farmer or producer engages in a hedging operation, he is locking his price in before the crop is produced. As long as he lifts his hedge when the cash transaction occurs, neither an increase nor a decrease in value of the crop will affect the price. Only changes in the relative price between cash and futures markets can influence his locked-in price.
A Wonderful Year
Cornell's Forensics Team is about to complete its best year ever, according to the team's advisor, communication department senior lecturer Dr. Pamela Stepp.

The team's more than 50 members finished third in the nation in the Cross Exam Debate Association's annual competition. About 269 schools participate in the tournaments, and each team's six best competitions are averaged together to determine the final rankings, Stepp said.

The speech and debate team competes in other national competitions as well. For the first time ever, Cornell took first place in the annual Delta Sigma Rho tournament, sponsored by the Delta Sigma Rho forensics honor society.

While Cornell has finished as high as third before, Stepp said the individual performances of the team members is what makes this Cornell's best year ever.

Danyelle Coleman '93 is this year's national champion in the dramatic interpretation category. And debate partners Jeremy Rosen '93 and Marc Kesselman '93 took third place in debate.

The team has yet to compete in several smaller national competitions.

Geneva Retirement
Department of Horticultural Sciences professor Dr. James N. Cummins recently announced his retirement from Cornell's New York State Agricultural Experiment Station in Geneva.

Cummins, a world authority on fruit tree rootstocks, has been a leading researcher at the experiment station for 25 years. Under his newly-acquired title of professor emeritus, Cummins will continue his research on a smaller scale while a suitable replacement is sought.

With Department of Plant Pathology professor Dr. Herbert S. Aldwinek, Cummins has been developing disease-resistant apple rootstocks in the largest breeding, selection and orchard testing program of its kind in the world. "Geneva 65," a rootstock which produces a dwarf apple tree resistant to bacterial fire blight, crown rot, apple scab and mildew, was introduced last year as the first commercially available rootstock developed from the program. Other rootstocks are due out in the near future. These are the first disease-resistant apple rootstocks developed in the United States.

In addition to his research, Cummins has taught at Cornell's Ithaca campus, lecturing on nursery management, orchard management and land propagation. He also serves as an associate editor for HortScience, a professional journal.

Peer Recognition
John G. Seeley, professor emeritus of floricultural science, was recently appointed an honorary member of the International Society for Horticultural Science. Seeley became one of only nine of the society's honorary members worldwide.

Professor of soil, crop and atmospheric sciences Gary W. Fick was elected a Fellow of the Crop Science Society of America at the CSSA's annual meeting in Minneapolis.

A leader in multidisciplinary research in forages, Fick has helped develop crop growth models for use in integrated pest management and the prediction of forage quality.

On Oct. 1, 1992 Michael Joseph Jr. was awarded the Distinguished Service Award from the New York State Council of School Superintendents. Joseph, the executive director of the Rural Schools Program and former superintendent of the Marathon Central Schools, received the council's highest honor in recognition of his exemplary service to public education.

Handling Garbage
With help from Cornell, local business leaders can learn the latest techniques for handling the messiest part of their business — garbage disposal.

Through classes offered jointly by the Waste Management Institute, Department of Agricultural and Biological Engineering and Cooperative Extension, leaders can learn the latest developments in the field of garbage engineering, making garbage disposal cheaper and more environmentally friendly.

The course roster includes incineration design and ash management; landfill design and closing practices; municipal composting; recycling collection and separation technologies and environmental monitoring for soil, water and air quality.

Project PigeonWatch
Despite the fact that city pigeons always seem to be underfoot, little is known about the birds' behavior patterns. But the Cornell Laboratory of Ornithology plans to involve inner city school children in a research project to change that.

Project PigeonWatch, one of three science-education projects supported by a recent grant from the National Science Foundation, will benefit both young students and Cornell researchers. While the city schoolchildren learn techniques of scientific observation, the otherwise unobtainable data they gather will be analyzed by ornithologists.

Students in Washington DC and New York City will try to determine the effect of different colors and feather patterns on the pigeons' breeding and feeding success.
THE COUNTRYMAN STAFF WAS treated to an interesting albeit frustrating surprise recently. Six awards were presented to the magazine in the fall of 1992, and while the staff of that year undoubtedly merits praise, they were not the ones for whom these plaques were intended. Each celebrates excellence in journalism; one, presented by the Farm Journal, is a first-place award for “General Excellence Among Agricultural College Magazines” in 1948. Another (undated), given by Capper’s Farmer celebrates the Countryman’s “… use of best material of interest to women.” Three of the awards were presented by Successful Farming magazine in recognition of superb cover design in the years 1954, 1959 and 1961 and one was presented by Sigma Delta Chi and Pi Delta Gamma for the best feature article of 1941-43.

The frustrating part of this otherwise pleasant surprise has been trying to figure out just how we’ve come to possess these antique awards. We know that they were discovered in the house at 640 Stewart Avenue by contractors who were involved in the remodeling of the building. According to Priscilla Noetzel-Wilson, the plaques were located inside a partition that was being removed from the structure.

Understandably curious, we at the Countryman wondered how these things came to be inside a wall. Upon checking the history of the home, we found that it had been designed by William H. Miller 1878 for Robert Treman in 1903. The Treman family subsequently sold the home (then at 411 University Avenue) to Cornell University in 1944. It was rented to the Phi Sigma Delta fraternity. Perhaps a brother has our answer.

If you think you have some information regarding our little mystery, please contact us.

by E. Kurt Lienau '95