AGRICULTURE AND LIFE SCIENCES

news

A Statutory College of the State University of New York, at Cornell University, Ithaca, NY NOVEMBER 1979

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In the [illegible] more than a year ago, the entomology building was to be on the Agriculture Quadrangle in the open space between what is now the Roberts complex and Caldwell Hall. [illegible] Lower Alumni Field, the Quad end will remain open. The structure will also be close to the new biology building scheduled for groundbreaking this fall. The location is bound to be convenient for students and faculty alike.

The decision to demolish Roberts and [illegible] was made after close study by College and University administrators. The buildings were constructed in the early part of this [illegible] and [illegible] longer meet the [illegible] needs of [illegible] administration. Two organizations, Historic Ithaca and the Ithaca Landmarks Preservation Commission, had [illegible] to have the structures renovated. [illegible] conclusion that our most responsible position is to request demolition of Roberts, East Roberts, and Stone, and to construct a new building on the [illegible] buildings, but the costs of renovating are just too high."

According to Call, remodeling to meet state standards would cost $9 to $10 per square foot more than building from the ground up. The minimum additional cost would be about $[illegible] million or more, [illegible] and not [illegible] expense.

The high price of remodeling may be hard to understand, considering that the basic shell would already be [illegible] if the interiors were [illegible] efficiency for academic buildings are much easier to meet with new construction.

For instance, the law requires [illegible] be replaced, since combustible materials in major structural parts are not permitted.

"As dean, I would have to think long and hard before asking for an exemption from an energy code," Call said. "And, I will not apply for a variance on codes that affect life and [illegible]

[illegible] Department of Entomology moves out of Comstock and Caldwell, those buildings will be given to Cornell by the state and they will be used to house collections and other reference materials. Call estimates that construction on the entomology building will begin in the spring of 1981. It will have 58,460 square feet of floor space. The demolition of the Roberts complex [illegible] the spring of 1983. The [illegible] will have over 61,000 square feet.

"We will do everything in our power to preserve the integrity of the [illegible] Quad," Call emphasized. "Some [illegible] features of [illegible] seal on the roof above the main door, will be preserved and possibly incorporated into the new construction."

Is Ozone Pollution Sour Grapes?

The L. H. Bailey Hortorium

Frogs Listen Before They Leap

Energy Efficiency On The Farm

Bob Foote - Bullish On Breeding

The 75th Anniversary– The Festivities and the Forums

Dean Call chats with Mr. and Mrs. Myron Fuerst during the anniversary reception.

More than 3,000 people attended the 75th anniversary celebration of the New York State College of Agriculture and Life Sciences on May 12. Tours of College facilities, and exhibits of its contributions to agriculture, began the day commemorating the College's 75-year affiliation with the State of New York and its extraordinary history of innovation and success.

After an afternoon of faculty forums covering subjects from agricultural economics to food science, the day culminated in a reception and banquet attended by more than 1,000 guests.

Cornell President Frank Rhodes and Clifton R. Wharton, Chancellor of the State University of New York, were the keynote speakers. A special resolution adopted by the N.Y.S. Legislature honored Provost W. Keith Kennedy, former dean of the College, for his dedicated service and leadership in agriculture. All of the food and beverages were produced in New York State.

Although most of the day's activities were decidedly festive, some serious subjects were tackled by faculty during three-and-a-half hours of lectures and symposia.

Inflation and Agriculture— What's Ahead?

Cornell agricultural economists cited an unwillingness among Americans to confront the causes of inflation and characterized it as an economic game of chance with each group trying to pass its losses off to another.

"Inflation persists because no one wants to take a cut in income," said Kenneth L. Robinson, Liberty Hyde Bailey Professor of Agricultural Economics. "We are unwilling to accept the consequences of a no- or slow-growth economy, but inflation will persist as a way of forcing us to do involuntarily what we are unwilling to do collectively—that is, to cut back on our purchases of goods and services.

"Everyone is fighting for a larger share of an economic pie that is no longer growing at the rate it did five or ten years ago. Our expectations are still influenced by an era in which real income per capita increased at a rate of 20 to 30 percent each decade, which it did from about 1939 to 1973," he noted.

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In the original plans, formulated more than a year ago, the entomology building was to be on the Agriculture Quadrangle in the open space between what is now the Roberts complex and Comstock and Caldwell Halls. In moving it to Lower Alumni Field, the Quad's west end will remain open. The structure will also be close to the new biology building scheduled for groundbreaking this fall. The location is bound to be convenient for students and faculty alike.

The decision to demolish Roberts Hall and adjacent buildings comes after months of local controversy and close study by College and University administrators. The buildings were constructed in the early part of this century and no longer meet the standards of the federal Occupational Safety and Health Administration. Two organizations, Historic Ithaca and the Ithaca Landmarks Preservation Commission, had pushed to have the structures renovated rather than torn down.

"We reluctantly have reached the conclusion that our most responsible position is to request demolition of Roberts, East Roberts, and Stone, and to construct a new building on their site," Call said. "We sincerely wanted to avoid demolishing the buildings, but the costs of renovating are just too high."

According to Call, remodeling to meet state standards would cost $9 to $10 per square foot more than building from the ground up. The minimum additional cost would be about $1 million or, more realistically, $1.5 million. He said the state would not accept the extra expense.

The high price of remodeling may be hard to understand, considering that the basic shell would already be there even if the interior were completely gutted. But stringent state codes regulating safety and energy efficiency for academic buildings are much easier to meet with new construction.

For instance, state law requires tight new windows that would be much harder to fit into existing openings. The walls would have to be reconstructed to hold at least four more inches of insulation. This is not only expensive, but would preempt valuable floor space. And the entire wooden roof would have to be replaced, since combustible materials in major structural parts are not permitted.

"As dean, I would have to think long and hard before asking for an exemption from an energy code," Call said. "And, I will not apply for a variance on codes that affect life and safety."

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"We will do everything in our power to preserve the integrity of the Ag Quad," Call emphasized. "Some of the outstanding features of Roberts, such as the seal on the roof above the main door, will be preserved and possibly incorporated into the new construction."

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is likely to continue, the consequences of a persistent rise in prices are not likely to be catastrophic. Dismissing forecasts of doom, he said, "Continued inflation will mean a reduction in the level of living for some, but only to that prevailing perhaps a decade ago, not to that of 20 or 30 years ago."

Max E. Brunk, professor of marketing, forecast a considerably higher inflation rate of between 10 and 20 percent in the next few years, but agreed with Robinson that wholesale attempts to get around inflation is one of the primary reasons for it.

"Inflation," he predicted, "will continue to be politically generated so long as a large number of articulate voters actually benefit from its effects."

The 75th Anniversary

Trends in Food Science and Technology

Robert C. Baker, professor of food science, charged that the American food pipeline is wrought with leaks that must be repaired.

Baker said that 1.7 billion pounds of milk is wasted annually during processing, and one-third of all milk protein is wasted or fed to animals. In the milling of corn, he pointed out, 800 million pounds of protein is lost or fed to animals. Eight percent of bread and pastry goes stale before it reaches the consumer, and 25 percent of all fruits and vegetables is lost after harvest.

He said that 800 million pounds of chicken necks and giblets is wasted. Baker also noted that 70 to 80 percent of all fish is discarded because they are too bony, unpopular, or have ugly names like sucker and crappies (ALS *News*, April 1978).

Professor Willard B. Robinson, head of the Department of Food Science and Technology at the N.Y.S. Agricultural Experiment Station at Geneva, outlined some of the specific ways in which the comparatively young field of food science has cut down on rampant food waste.

"Formerly, 14 percent of all grape juice was spoiled and lost forever," he said. "But the simple discovery that a mold organism responsible for the spoilage was introduced through the cork on the juice containers has slashed the waste to only half a percent.

"Another important achievement was our work on the mechanical harvesting of grapes, which they said couldn't be done," Robinson added. "But now a great deal of fruit which would otherwise rot on the vines is mechanically harvested."

Professor John E. Kinsella, chairman of the Department of Food Science in Ithaca, said that modern food science has greatly enhanced the supply and selection of nutrients in the American diet.

"Not only has modern food technology provided a broad array of convenience foods and reduced much of the drudgery in the kitchen, it has also aided in the fortification of foods such as milk and thus reduced many diseases stemming from poor nutrition.

"Current projections call for a world population of 6 to 7 billion by the year 2000. Clearly, the work of food scientists in reducing post-harvest losses, improving efficiency, and developing new sources of nutrients will grow even more vital," he stressed.

Trends in Animal Science

Advances in animal production were discussed by three professors from the Department of Animal Science. Richard G. Warner and Robert H. Foote pointed out that the number of cows in the state has declined since 1904 from approximately 1.5 million to 999,000, but annual milk production has increased from about 4 billion pounds to 10.5 billion pounds. Production per cow has increased from 4,500 pounds to 11,500 pounds per year in all herds. Warner said, "Cows in New York State have consistently produced more milk per cow than the United States average."

This increase was attributed to better forage, higher grain consumption, improved rations, selection of better cows, improved calf and heifer rearing, sire sampling programs, and the widespread use of genetically superior sires through artificial insemination *(see story on p. 4)*.

In concluding remarks, Robert J. Young, chairman of the department, predicted that animal production is entering a new era and that as much will be accomplished in the next 25 years as was in the past 75.

Changes in Communities and Institutions: The First 75 Years, The Next 25

Gordon J. Cummings, professor of rural sociology, noted that although New York State's population has been declining since 1970, the population of its rural communities has grown steadily over the past 50 years.

The slowdown in the state's population has created problems that are extremely complicated. "We must promote the knowledge and self-confidence to participate in making decisions on the complex issues affecting communities," he said.

Frederick H. Stutz, professor emeritus of education, said education is the largest component of state government today and the major enterprise among local governments.

To solve the problems facing education, Stutz suggested researching the problems of small communities and small schools; organizing rural communities to seek collective solutions; fostering closer partnerships among public schools, vocational programs, area community colleges, and other community agencies; and encouraging joint action to acquaint legislators and state agencies with changes needed in state aid and taxes.

Speaking on regulating land use, Howard E. Conklin, professor of land economics, said, "We have a new pattern of human habitation upon the land—one that never existed before in the history of the human race. It is a pattern in which large numbers of city people live in the country."

The problems that are being created by the rapidly growing nonfarm rural population include inflated land prices and increased taxes. Some people advocate zoning to keep people in the cities or at least separate them from farmers.

"Zoning in the cities is one of the reasons so many people want to live in the country," Conklin maintained.

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Alumni Association Membership Up 117 Percent

Membership in the Alumni Association of the College of Agriculture and Life Sciences has increased more than 117 percent since October 1978. At that time, the rolls stood at 1,660. Since then, 1,950 have signed up.

With 3,610 members, the CALS Alumni Association is now the largest college alumni association at Cornell.

The surge in membership is due largely to two successful direct mail drives held in September and March.

The Alumni Association helps keep the College great through the participation of its members. They stay in touch, spread its reputation, and support projects that nurture enthusiasm and outstanding performance among students and faculty.

The dues are only $4 a year, or $10 for three years. The *Cornell Countryman*, published seven times a year, is included. Besides letting you know what's going on at Cornell, the *Countryman* provides valuable experience for the students who write and edit it.

YES!

I want to join the hundreds of fellow alumni who are now members of the Alumni Association of the College of Agriculture and Life Sciences.

I will get the **Cornell Countryman** seven times a year for the full term of my membership.

☐ **I am enclosing $4 for a one year membership**
☐ **I am enclosing $10 for a three year membership**

The New York State College of Agriculture and Life Sciences
205 Roberts Hall
Cornell University, Ithaca, NY 14853

Please make checks payable to Alumni Association—CALS

Name _____ Class _____

Address _____

_____

Alumni Association
The New York State College of Agriculture and Life Sciences
205 Roberts Hall, Cornell University Ithaca, New York 14853

Wind Harnessed to Heat Water: –No Electricity–No Gas–No Oil–

For more than 500 years, spinning windmills have pumped water and ground grains on farms throughout the world. Although most often thought of as picturesque vestiges of the Old World, they were in fact indispensable to American pioneers. Whirling with the wind, they brought water from deep beneath the surface of the Great Plains to turn a dust bowl into a bread basket.

Now, they are on their way back as a clean and reliable source of energy. Engineers across the country are striving to make windmills more practical by designing better turbines, more powerful generators, and longer-lasting storage batteries.

At Cornell, Wesley Gunkel, professor of agricultural engineering, has a much simpler approach. He is heating water merely by stirring it up.

High on a hill above the sheep and cattle barns at the Animal Science Teaching and Research Center in Harford, N.Y., stands his 40-foot tower capped with three twirling fins. Unlike conventional designs with propeller-like blades, these point straight up in the air, usually turning at three times the speed of the wind.

A long axle is attached to the turbine, which, in turn, is connected to another set of blades. They churn the water in a 30-gallon tank until it becomes piping hot.

"My main objective is to come up with a water-heating system that is simple," says Gunkel, "simple to operate and simple to maintain. We are now proving that it is possible and practical to have such a system not only on the farm but also in individual homes."

Because Gunkel's windmill produces energy through direct mechanical drive, there is no need to first convert the wind's power to electricity. There are no cumbersome batteries, electrical generators, or heating elements.

"Every time you convert one form of energy to another form, you lose some of it," explains Gunkel. "By eliminating components that, in effect, drain some of the available energy, you can heat water more efficiently."

At a steady wind speed of 20 miles per hour, Gunkel's experimental windmill, which is only 12 feet in diameter, can heat 20 gallons to 170 degrees in one day. This may seem slow. But, at twice the speed, about 160 gallons can be heated to the same temperature. A basic law of physics states that if the wind velocity is doubled, eight times the energy is produced.

Gunkel's windmill takes optimum advantage of this precept because the agitator acts as a governing device. It assures that the amount of energy available to heat water is always roughly commensurate with the amount of energy captured by the blades.

"With a conventional system that generates electricity, if the blades start rotating faster than a set speed, the amount of energy captured levels off. With this system, the amount of energy continues to rise with the wind speed."

The simplicity of this system will make it ideal for dairy farms, where almost 25 percent of the electricity is used to heat water. Moreover, according to Gunkel, these windmills are perfectly suited to supply hot water to farmhouses and even to individual homes in residential areas.

Right now, however, he is still testing his experimental model. Wind speed, wind direction, outside temperature, and barometric pressure are constantly measured with sophisticated electronic gear. Within a year, this information will be compiled and evaluated to reveal the windmill's performance under varying conditions.

The next step is a larger system, capable of producing ten times the energy. By that time, the equipment itself will be less expensive. Gunkel's turbine, manufactured by the Pinson Energy Corporation of Massachusetts, cost $5,000 a little over one year ago. The U.S. Department of Energy has contracted with several manufacturers to lower the price by at least half.

As electricity rates rise, windmills, with their potential to provide energy independence, are becoming ever more attractive. Still, the initial expense of the equipment and subsequent maintenance costs have remained higher than the electric company's bills. If, however, water can be heated reliably by stirring it with the power of the wind, some of these costs will be eliminated.

Gunkel with his direct-drive windmill. The hut beneath the tower houses the hot water tank and the monitoring equipment. (Photo: Yong Kim)

"If the price of producing electricity with windmills can be justified, then this system will be even more desirable," says Gunkel. "There is less to buy in the first place, less to break, and usually all you have to do is grease the bearings once a year."

Extension Pushes Energy Efficiency on the Farm

by EVERETT D. MARKWARDT
Extension Professor of Agricultural Economics

New York State agriculture is energy-intensive and requires an enormous amount of electricity and other power from fossil fuels. Agriculture's demand, however, differs from that of other industries. It increases and decreases from season to season. And a shortage of fuels even for a short time during harvesting, greenhouse heating, or planting can result in the loss of all or part of a year's crop. Also, farmers cannot substitute one form of energy for another on short notice.

Agriculture actually does not consume that much energy, compared with transportation or other industry. Farm production draws only about 3 percent of the total fuel used. Despite this fact, it is essential that farmers manage their energy to get the most done for the least energy.

To help meet this challenge, the Agriculture Energy Management Program was started by the CALS agricultural engineering department in 1977 with the cooperation and support of the N.Y.S. Energy Office and the N.Y.S. Department of Agriculture and Markets. Its goal is to encourage farmers to adopt several energy management and conservation techniques. It is to help them become more conservation-minded and to evaluate energy conservation methods under farm and home conditions. The program also is designed to identify new energy research and information needs.

Since most of the energy used for crop production is consumed by tractors, they are emphasized as a key to conservation. Rick Koelsch, our extension energy engineer, has borrowed a tractor from Ford Motor Company that, through its special instrumentation, monitors the effects of conservation practices.

Demonstrations with it clearly showed farmers that loading the tractor correctly and using dual wheels to reduce slippage save fuel. Additionally, the importance of tuning the engine, using radial or flotation tires, combining field operations, and reducing unnecessary trips has been clearly demonstrated.

Many other operations around the farmstead offer similar opportunities for energy savings. One of the most promising is to capture the waste heat from the process of cooling milk and use it for heating water. Eighteen dairies statewide have saved about $10 per cow per year by doing just this. And the cost of the equipment and installation will pay for itself in two to three years.

Another practice that saves dairymen money and energy is cooling milk in-line. That is, by precooling the milk with water, cooling capacity can be significantly increased.

Also, just as in the home, insulating the hot water tank to reduce heat loss, repairing dripping faucets, and setting thermostats properly can save energy on the farm.

Grain farmers are encouraged to consider high moisture storage rather than drying grain or corn with hot air. Some are using organic acid preservatives and crib storage of ear corn as a way to save energy.

When heater air drying is necessary, however, dryeration is suggested. This is a process whereby hot grain is removed from the dryer and placed in cooling bins. Two percentage points of moisture are removed through cooling and aeration, and the grain is then ready for safe storage.

Greenhouse operators are conserving by using their greenhouses less in the winter and lowering temperatures for some crops. They are tightening the seals around each pane of glass to let less cold air in.

Those having greenhouses covered with plastic are encouraged to use two layers instead of one. Materials that reflect heat back into the greenhouse are put behind heating pipes. Some farmers are covering their greenhouse crops at night with thermal blankets, which trap air heated during the day and greatly reduce the need for additional sources of heat when the sun goes down.

The use of alternate sources of energy is also being encouraged where feasible. As of now, though, we are mainly keeping farmers informed about the latest developments and how they might apply to agriculture.

Wood, however, as a renewable source of energy, is widely used on farms and in rural areas. A recent survey by Cooperative Extension shows that 1,700,000 cords of wood were burned in New York State last year, a savings that amounted to 3,128,000 barrels of oil.

The Department of Agricultural Engineering is constantly exploring other ways to lessen the farmer's dependence on fossil fuels. At the Animal Science Teaching and Research Center, the production and use of methane gas on a 60- to 80-cow dairy farm is under study. This is the size of an average dairy farm in New York. And the gas can be used for everything from running a tractor to lighting the kitchen range.

The possibilities of harnessing the wind to heat water are also being researched (*see story, p. 3*). And projects are underway to use solar energy on the farm.

The Agriculture Energy Management Program is now tackling perhaps the most serious problem facing agriculture today. Reducing fossil-fuel consumption without adversely affecting production is indeed a complex challenge. Through research and actual field work on operating farms, it is being met head-on. Also, bulletins and other information related to energy use are always available through local Cooperative Extension offices. Only by working to conserve, exploring new avenues, and disseminating the knowledge we have, can this battle be won.

Bob Foote—Bullish on Breeding

by RICHARD A. SPINGARN

The day I interviewed Bob Foote, I sat right beside the bicycle parked in his office and waited.

"Yesterday, I was in at 5 A.M. and out at 1 A.M.," he says, hoping that I will now understand why he is scribbling feverishly at his desk, while I am idly gazing at his bulletin board filled with reminders to attend conferences and meetings and trying to decipher titles on his bookshelf that have something or other to do with animal reproduction.

Suddenly he drops his pen and it is my turn to scribble.

"Quality is the most important thing to a scientist."

"I swing at most pitches and occasionally at the wrong pitch. But you never hit a home run unless you swing."

"Science depends on the art of the scientist— not only knowing what to do, but how to do it."

"Just because I teach does not automatically mean that students learn."

I wonder if this is the end of the interview and if Professor Foote will now hop from his chair to his bike and race through the maze of offices in Morrison Hall, shoot through the lobby to Tower Road, and be off to teach a class, breed some cows, or advise Congress on the implications of test-tube babies.

Bob Foote does all of this and more. He teaches *Animal Science 220*, which, with more than 250 students a year, is one of the College's most popular courses. He conducts intensive research that has helped make cattle breeding a precise science, replacing the guessing games of the past. And he is a member of the U.S. Department of Health, Education and Welfare's Ethical Advisory Board, seeking to establish federal guidelines for *in vitro* fertilization. In other words, recommending whether or how much we should experiment with making babies in the laboratory.

Also, Foote is striving, at a lightning pace, to learn more about the complexities of animal reproductive physiology and to share that knowledge both with his students and with society. For, as arcane as semen preservation and artificial insemination may seem, perfecting these techniques will ultimately mean increased beef and dairy cattle production and, consequently, better supermarket prices. Moreover, a more thorough understanding of animal reproduction can only lead to valuable clues about human reproduction.

Ever since 1950, when Foote completed his graduate study here, he has been trying to find ways to improve the quality of cattle. Selective breeding became possible when Charles R. Henderson, now professor emeritus of animal breeding, developed methods for identifying superior bulls.

Actually, the College of Agriculture and Life Sciences has pioneered many of the techniques used to improve cattle productivity through genetics. In the 1930s, formal artificial insemination research started here; and by the latter part of the decade, Professor G. W. Salisbury found that sperm life could be prolonged if the semen were placed in a solution consisting mainly of egg yolk and other nutrients. Studies of bull behavior revealed ways of sexually stimulating the bulls so they would produce more fertile semen.

Cornell has led the way in many other aspects of reproductive physiology and artificial insemination. Professor William Hansel has pioneered techniques for precisely regulating when cows come into heat.

"The purpose of the whole program is to breed better livestock and breed livestock better," Foote remarks.

Foote has concentrated on finding bulls that not only imbue their progeny with the best attributes, but are also highly fertile. He has helped develop methods through which semen can be preserved and shipped to farmers to build more productive herds throughout the country.

"A good bull produces 30 to 40 billion sperm per week," Foote explains. "But, a cow needs less than 30 to 40 million for conception. The large excess is wasteful because it does not increase the chances that she will conceive. There is thus a potential to inseminate 1,000 cows per bull per week, and we want to come as close to that figure as possible."

This goal has now become more realistic because of sophisticated processes for collecting semen in a clean environment, testing the sperm for potency, and preserving fertility through cooling. It is in these areas that Foote has perhaps made his most important contributions. He has improved techniques to slow the deterioration of semen, protect it from thermal shock when it is frozen, and reduce damage to cells when it is thawed.

Now, semen from the finest bulls can be frozen to -320° F and, if necessary, stored for many years before it is used to propagate increasingly productive lines of beef and dairy cattle.

Foote has been equally ingenious as a teacher. Despite the size of his large undergraduate animal science lecture course, his students learn some advanced laboratory techniques so they can experiment, observe, and discover for themselves.

Foot wanted to get his students into the laboratory, but could not afford the staff to teach them the correct techniques and procedures. So he designed a series of simple experiments and renovated an old storeroom to accommodate small carrels where students, individually and at their own pace, could learn about anatomy, anaesthesia, and surgery. By using movies, slides, enlarged snapshots and tape recorders, they learn how to handle and care for the animals and how to interpret the results of their experiments.

"This approach exposes students first-hand to the intricacies of the marvelous process of reproduction," says Foote. "It not only provides insight into farm animal reproduction, but also helps them understand our own reproductive system."

Just as Foote is skilled with undergraduates, he has guided and inspired outstanding research by his graduate students. One student, now at the University of California at Davis, was the first to have steady success producing twins in cattle. It is now possible to genetically induce cows to have two calves instead of one. Before this innovation, there was only a two percent chance that a cow would bear twins. Now, under controlled conditions, the rate may be as high as 70 percent.

Foote is now exploring management schemes to assure that cows can produce enough milk to support extra calves. "It can mean double the number of packages of meat," he says.

He also asserts that a supply of extra cattle can serve as a buffer in years with low harvests of grains, vegetables, and fruits. "They can harvest plants people can't eat. They can shift to things like grass. People can't. Pushing for more efficiency will keep our diet nutritious and delicious."

Foote explains a fine point of surgical technique in his autotutorial laboratory.

Webster Named Professor of Merit

Dwight Webster

Dwight A. Webster of the Department of Natural Resources was presented the Professor of Merit Award by 1979 graduating seniors. The award recognizes Webster for his advising and teaching abilities.

A fisheries biologist, Webster first started teaching in the College in 1942 while working for his doctorate degree. From 1967 to 1971, he was chairman of the Department of Natural Resources. Currently, he teaches a course in techniques of fishery science and supervises research of both undergraduate and graduate students.

Webster has carried out extensive research on lake and rainbow trout in the Finger Lakes and on brook trout in the Adirondacks. Recently he has been examining a strain of brook trout that appears to have some tolerance for acid water, a problem that has decimated trout populations in the Adirondacks, as well as in Norway.

He has studied trout in Cayuga Lake for many years in cooperation with the State Department of Environmental Conservation and the U.S. Fish and Wildlife Service. He also designed the fishway and collecting facility for the flood project on Cayuga Inlet and at Myers Point.

Webster has written more than 70 technical and popular articles on trout production and management. His knowledge of aquatic insects and his skills in making artificial flies led him to collaborate on the book, *The Origins of Angling*.

One of the drafters of the North American Trout Policy, Webster received the Trout Conservation Award in 1965 from Trout Unlimited, a national organization of trout anglers.

He has been president of th Northeastern Division of the Ameri can Fishery Society and chairman c its Special Projects Committee. H has also been a member of th Scientific Advisory Committee of th Great Lakes Fishery Commission.

The Professor of Merit Award presented each year by Colle seniors to the professor the majori holds in the highest esteem. Tl election is coordinated by Ho-Nu Da-Kah, the College's honora society.

Laboratory at Uihlein Farm Dedicated

Ed Jones shows Henry Uihlein a potato plant grown through meristem tissue culture. The new greenhouse is in the background. (Photo: Yong Kim)

The Uihlein Farm of Cornell University, where 220 tons of disease-free seed potatoes are developed for release to New York State seed growers each year, has received a new $330,000 laboratory and greenhouse. On June 29, 1979, dedication ceremonies were held at the farm, located about two miles south of Lake Placid.

The new facilities will be used to scrutinize potatoes for both obvious and latent diseases and, through the technique of meristem tissue culture, grow "clean" seed potato foundation stock for New York's $70 million potato industry.

This addition to the Uihlein Farm was made possible through a gift from Mr. and Mrs. Henry Uihlein II, who, in 1961, originally gave 317 acres to Cornell's College of Agriculture and Life Sciences exclusively for the development of the basic stock used by the state's potato farmers. The land is located high in the Adirondack Mountains where the climate is ideal for potato growing. The Uihleins themselves at one time used their farm to grow certified seed potatoes.

Meristem tissue culture, a relatively new technique for producing disease-free potato stock, is superior to past methods because of its speed and reliability. A microscopic piece of tissue is removed from the meristem, or growing tip, of a sprout. The tissue is then grown into plantlets under sterile conditions and screened for pathogens.

The plantlets are grown in a greenhouse and, with sophisticated electronic equipment, are continually inspected for infestations. Diseased plants are discarded. Healthy plants are allowed to grow to maturity, and their resulting tubers are eventually planted in the fields, where they thrive. The often exceptionally high yield of seed potatoes is sold to growers throughout the state.

These techniques for producing test-tube potatoes have been perfected under the direction of Professor Edward D. Jones, plant pathologist at the College. Speaking before an audience of more than 200 guests at the dedication ceremony, Jones explained how meristem tissue culture surpasses conventional methods of producing seed stocks.

"By using tissue culture techniques, we can have greater assurance that seed stocks are free of disease organisms. The method also allows for more rapid multiplication of plants," he said.

"We feel especially fortunate to have this facility at this time," he added, "because of the threat the golden nematode poses to the potato industry. This facility will enable us to give newly released golden-nematode-resistant varieties into the hands of growers much sooner than was possible through the old methods."

Jones, who has been responsible for the overall operation of the research farm since its establishment in 1961, noted that New York is one of the top ten potato-producing states in the nation. About 50,000 acres, almost equally divided between upstate New York and Long Island, are devoted to the crop annually.

A highlight of the dedication ceremony was the presentation of the new laboratory and greenhouse to Cornell by Mr. and Mrs. Uihlein. "Today is a very happy and special day for Mrs. Uihlein and myself. Little did I realize 60 years ago, when I first saw this farm site in 1919, that this piece of land would someday become one of the major agricultural research farms in the United States."

After accepting the facility on behalf of the University, Provost W. Keith Kennedy unveiled a portrait of Uihlein, which will be hung in the reception room of the laboratory.

The Uihleins were also honored by seed potato growers of the state. William A. Leavitt, chairman of the Foundation Potato Committee, which represents both seed and potato stock growers, presented an oak pen holder which reads, "This oak, strong and inspiring, stood beside Ezra Cornell's farmhouse as he founded Cornell University. Henry Uihlein II, like the oak, has added strength and inspiration to Cornell and to the future of New York's potato industry."

The potato growers also honored Professor Jones. Thomas Norman, Jr., of Saranac Lake, N.Y., presented Jones with a bronze plaque which recognized his "untiring service" to seed growers of the state.

Looking ahead, Jones said that the research farm, along with the new tissue culture laboratory, will continue to serve producers and consumers in the state as a dependable source of disease-free seed stock. And Professor Durward F. Bateman, former chairman of the College's Department of Plant Pathology, predicted that the dedication of the laboratory would be a milestone in turning the fruits of basic scientific research dating back to 1902 into the technology of practical agriculture.

"We believe this facility represents the beginning of a new era in scientific agriculture for the potato industry of the state," Bateman concluded.

save Energy save Dollars

Save Energy, Save Dollars

The New York State Cooperative Extension consumer manual *Save Energy, Save Dollars* is now in its third year of publication. Acclaimed by the *New York Times* as a complete and useful guide, this booklet contains hundreds of hints on how you can conserve energy in your home, in the way you dress, and in your general lifestyle.

Save Energy, Save Dollars is a product of research conducted by faculty of the College of Agriculture and Life Sciences and the College of Human Ecology.

It costs $1.50 and is available at local N.Y.S. Cooperative Extension offices or through Distribution Center, 7 Research Park, Cornell University, Ithaca, N.Y. 14850.

Two Win Chancellor's Awards

Joseph M. Calvo, associate professor of biochemistry, and Lyle H. Wadell, manager of the Dairy Records Computing Center, have been honored by the State University of New York.

Calvo was given the Chancellor's Award for Excellence in Teaching, an honor reserved for those who have demonstrated superior performance as teachers within the state university system.

Wadell won the Chancellor's Award for Excellence in Professional Service and is one of the 24 nonfaculty professionals so commended this year for outstanding job performance.

A member of the Cornell faculty since 1964, Calvo is in the Section of Biochemistry, Molecular and Cell Biology of the Division of Biological Sciences. He has taught biochemistry courses at both undergraduate and graduate levels.

Among other achievements, Calvo has developed an innovative method for teaching undergraduate biochemistry. The course succeeds in stimulating interest and fostering an understanding of the process of science. Students progress individually despite large enrollment.

The course has been taught for 14 semesters to more than 300 students per year. Calvo's idea may well serve as a model for teaching biochemistry.

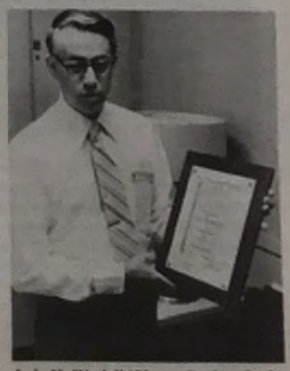
A native of Seattle, Calvo received degrees from Whitman College and Washington State University and was a Fulbright fellow at the University of Freiburg, Germany, and a postdoctoral fellow at the Cold Spring Harbor Laboratory, N.Y. His research focuses on how the genes that produce the essential amino acid leucine are controlled in bacteria. He is also one of the leaders in recombinant DNA research at Cornell.

Wadell joined the College's Department of Animal Science in 1959 as a research associate. In 1961 he was appointed manager of the Dairy Records Processing Center, where he has led in the development of an outstanding system for processing dairy herd records. It is now considered the most sophisticated in the United States.

In addition to providing dairy farmers with reliable and timely information used for crucial management decisions, Wadell has used his position to aid College animal scientists in their research.

A native of Elsie, Michigan, Wadell received his bachelor's and master's degrees from Michigan State University and his doctorate from Iowa State University. His professional affiliations include the American Dairy Science Association and the Biometrics Society.

Joseph M. Calvo



Lyle H. Wadell (Photo: Rodger Beck)

The Farm Credit Fellowship— A Look at the World of Finance

by DAVID BOOR '79

My years at Cornell were filled with memorable experiences. But some of these stand out more vividly than others for they had a great bearing on my life, building the foundation for my present ideals and allowing me to discover new directions and goals. One such experience was my participation in Cornell's Farm Credit Fellowship Program.

The Farm Credit Fellowship Program is an undergraduate program in agricultural finance conducted by the Department of Agricultural Economics at Cornell with financial support from the U.S. Farm Credit System. The objective of the program is to provide an opportunity for students with a strong interest in farm management and finance better to understand the agriculture credit system and to study special topics in the area of agricultural finance.

The Farm Credit Fellowship Program at Cornell is the only program of its kind at any university in the country. It not only increases the student's working knowledge of how various financial institutions across the U.S. run, but also provides insight into what employment in the world of finance might entail, particularly the field of agricultural finance.

The program is not designed as a recruiting program for the Farm Credit System, and students who interview for jobs with the System are not given priority. However, working knowledge of the Farm Credit System and a proven interest in agricultural finance certainly will not hinder chances, either.

This year, five members of the graduating class, including me, will be going to work for the Farm Credit System. Several other class members have chosen jobs in related agricultural finance fields.

In recent years the fellowship program has soared in popularity. The enthusiasm of past participants has attracted more and more applicants. My group had 16 fellows, selected by a faculty committee from the Department of Agricultural Economics.

What did the Farm Credit Fellowship Program do for me?

It gave me the opportunity to explore an exciting career field, a career that involved working with farmers and supplying them with the credit that is vital to their business. Having been brought up on a farm, I saw this as a chance to try an alternative career, to find out if the pastures really are greener on the other side of the fence. Though I have always been interested in farm management, it was the fellowship program that excited me enough to become interested in a career in agricultural finance after college, instead of going right into farming.

Last summer when the program began, I got a good idea of what it might be like to work for the Farm Credit System. Each of the class members visited an association office in the Springfield, Massachusetts, district for a week. We observed the responsibilities of the employees and traveled with them on farm visits. One of the best things about the job was getting the chance to get out of the office and visit with the farmers. I knew myself well enough to know that I could never sit at a desk with pen and paper all day.

The Farm Credit System, however, was not the only agricultural lending institution we studied. The program concentrated on others as well. Last fall we took a field trip to observe the role of the Farmers Home Administration in financing agriculture, as well as supplying credit for rural homes and community projects.

Between semesters, Farm Credit sponsored a field trip to the world of finance along Wall Street in New York City. What an experience! We visited the fiscal agency for the Farm Credit banks and learned how Farm Credit obtains loan funds through selling its own securities.

Again, we concentrated not only on Farm Credit's role, but also on that of other agricultural lenders, such as insurance companies, commercial banks, and the Mercantile Exchange. The trip also included tours of the New York Federal Reserve Bank, New York Stock Exchange, and various securities dealers.

During the spring term, all the Farm Credit fellows took a two-credit senior seminar. The purpose of this course was to discuss the New York City visit in depth and to participate in presentations by executives whose firms specialize in financing agriculture.

Few people have an opportunity to observe and contrast the different financial institutions as we did. Often an individual doesn't gain the insight and understanding of an institution's operation until that person is committed as an employee. The fellowship program gave us an inside view of several career paths without forcing us to make that commitment.

I feel that the fellowship program has opened doors to new opportunity for me. Perhaps I'll find that a career in agricultural finance is not for me and that I enjoy farming better. But at least I'll have given an alternative career a try. If it hadn't been for the Farm Credit Fellowship Program at Cornell, I may never have taken the initiative to interview with the Farm Credit System. I am grateful that the fellowship program inspired me to try something new.

Frogs Listen Before They Leap

Hearing is a sense that most of us take for granted. We are always listening and responding to sound, but the properties within the ear and brain that enable us to perceive and interpret are not completely understood.

Researchers in the Division of Biological Sciences, led by Robert R. Capranica, professor of neurobiology and behavior, have been approaching the problem in an unusual way by studying the auditory system of anurans—frogs and toads.

"Anurans are an excellent model for research in sound communication," says Capranica, who has a joint appointment in the College of Engineering. "In general, they have a small repertory of up to seven sounds, which makes them much easier to study than more complex animals."

Anurans are highly vocal creatures, according to Capranica. Each call they produce is essential to their survival. The male's mating call, for example, is a kind of trademark. It is the only means through which a female can recognize a male of her own species. With approximately 2,600 different species of anuran, it is crucial that she be able to identify the specific sound the male produces.

"By playing natural and synthetic calls to various kinds of frogs, we can gain some idea of the signal cues that a particular species uses in identifying the mating call of other members of that species," explains Capranica. "The advantage of synthesizing calls is that the various signal parameters can be altered independently."

The sounds are manufactured electronically and recorded on magnetic tape. "Very close approximations to the natural calls can be achieved," he says. "In fact, the animals themselves are unable to distinguish some of these synthetic calls from their own natural calls."

Recently, Capranica and one of his doctoral students, Peter Narins, took their equipment to the Luquillo Mountains in eastern Puerto Rico to study *Eleutherodactylus coqui*, a tree frog indigenous to that region. Unlike North American frogs that produce a single croak, the male of this species emits a two-note call, "co-qui."

By observing females put between two loudspeakers, it was found that they responded to the "co-qui" sound and to the "qui" note alone in much the same way. When the calls were played, the females actually leaped onto the speaker from which the call was coming. The "co" note by itself, however, did not attract the female.

The "co" sound, it turns out, is used by the male coqui as a means of establishing territory. The male will use it as a warning to an intruder of the same sex.

One of Capranica's main concerns is finding out how the frogs achieve this sensitivity and selectivity in their hearing. Analysis of anatomy and electrophysiology are carried out to explore this question.

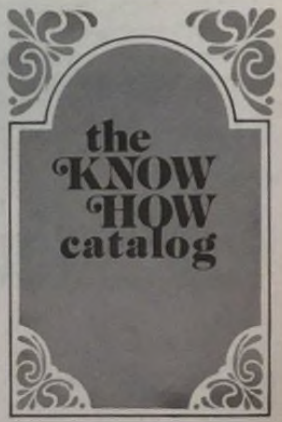
A frog's head is sliced into thin sections, which are stained with dyes that cause certain structures and nervous tissues to take on different colors. The organs of the inner ear can then be studied, and the pathways of nerves can be traced.

"These studies are important in deducing the 'wiring' diagrams of the auditory system," Capranica says. "The observations eventually lead to a schematic diagram similar to that for a complicated electronic instrument."

To study the frog's nervous system, microelectrodes are inserted into the auditory nerve or an auditory center of the brain. These instruments are able to detect the electrical activity of individual nerve cells. The signals are then passed through an electronic amplifier.

Using these methods, the response of the nerve cells to various acoustical stimuli can be analyzed. Sounds are played into the frog's ear. By changing the characteristics of these sounds, the relative sensitivity of nerve cells to different acoustic stimuli can be determined. Sophisticated electronic instruments and digital computers are used to process the data.

Capranica feels that his findings with anurans could be extrapolated to apply to humans. "Answers to the questions about the hearing of simple animals may shed light on the similar, but more complex, auditory systems in higher vertebrates, including ourselves," he says. "The croak of the bullfrog down in the pond may turn out to have considerable significance for us humans, as well as for his fellow frogs."



The *Know How Catalog* lists thousands of leaflets, brochures, packets, and booklets containing information gleaned from research conducted in the College of Agriculture and Life Sciences and College of Human Ecology. These publications give advice about gardening, farming, home maintenance, and much more; some are sure to interest you and your family. Most of the material is very inexpensive and some is free.

The *Catalog* itself is available at no charge from:

Mailing Room
7 Research Park
Cornell University
Ithaca, New York 14850

Division of Biological Sciences Gets New Director

Robert Barker, formerly chairman of the Department of Biochemistry at Michigan State University, has been appointed director of the Division of Biological Sciences. He succeeds Harry T. Stinson, who was interim director for one year.

"We are delighted to have found for the directorship a man with proven administrative abilities and scientific skills," remarked W. Keith Kennedy, University provost and former College dean, in announcing Barker's appointment.

The Division of Biological Sciences is composed largely of faculty in the College of Agriculture and Life Sciences. It covers the vast field of biology from the most esoteric to the most traditional.

"One of the main things that attracted me to Cornell was the opportunity to look at biology in a broader sense," says Barker, whose own research deals with carbohydrate chemistry and the use of stable isotopes such as carbon-13 as tools for the study of biological systems. "My biggest challenge will be to bring our biology community closer together so it can operate most effectively over this broad spectrum."

Barker sees biology as a rapidly moving frontier of new knowledge that must be fully explored so that humanity comes to better understand its biology, as well as other biological systems with which we must coexist.

"Biology is us; we are biology," he exclaims. "Yet, we know only ten percent of what we need to know about it. This can be dangerous because the government is now trying to regulate living systems that must obey biological, not human laws."

Barker feels it is essential we be able to evaluate risks in our society and decide if they will benefit or injure not only mankind, but the rest of a delicate environment.

"Does the guy who switches on his electric shaver in the morning realize what that luxury costs? There are all kinds of toxic substances released when he, and millions of other men, rely on this simple convenience. But all substances are toxic to some degree. Only by studying them thoroughly and weighing their effects completely can society intelligently determine if the cost is justified."

Because of this challenge, Barker believes biology is an essential ingredient in an undergraduate education. Furthermore, to fulfill the Division's obligation to the students and to society, he insists that both teaching and research at Cornell keep pace with the field's rapid movement.

"Despite recent attrition in federal support," Barker says, "the Division will maintain its strong commitment to basic research—research to evaluate the principal generalities behind phenomena. This is the only way we will assemble the basic facts necessary for practical applications."

Although it is tempting to confront specific problems directly in hopes of finding quick cures, explains Barker, it is imperative to strengthen our foundation of fundamental knowledge on which scientists in all fields can build.

"Scientists trying to solve specific practical problems draw constantly on basic research, and they will continue to do so. A seemingly insignificant discovery in one field could lead to a breakthrough in another.

"All of the Division's faculty are doing basic research to one degree or another. This thrust in basic science must be protected."

Likewise, Barker wants to preserve and improve the Division's strengths in preparing graduate students for the challenges their professional careers will present. He sees a need to give students the flexibility to move more easily within the Division, allowing them to explore biology's diverse disciplines and view biology from a broader perspective.

"I want to foster an atmosphere in which the Division remains appropriately responsive to society's needs. Both in teaching and research, each section must continue to foster outstanding performance. The result will be a stronger Division."

Robert Barker

Agriculture and Life Sciences Fund

by GLENN O. MacMILLEN, Assistant to the Dean

The Agriculture and Life Sciences Fund has a ten-year success story. Originally conceived as a short-term effort to raise one million dollars to endow undergraduate scholarships, it has become a pillar of private support for scholarships, innovative teaching, research projects, and special programs.

In 1969 the Board of Directors of the College of Agriculture and Life Sciences Alumni Association and Dean Charles Palm saw the need for an intensified fund-raising effort on behalf of the College. A three-year program was launched with a goal of a million-dollar endowment fund. Dean Palm chose Richard Church '64 to work with the Alumni Association in raising the money.

Three years later, the College had a new dean, W. Keith Kennedy, and the one million dollar goal had been achieved. But the Alumni Association Board saw the need for a more intensified effort. They developed the Fund Advisory Committee, whose sole responsibility was to raise private support for ALS. The immediate objectives, as stated by General Chairman Joseph P. King, were to provide scholarships for undergraduate students, to support innovative instructional programs, and to act as a vehicle whereby alumni and other friends of the College may participate in their own way in the future growth and development of the College.

Dean Kennedy appointed the first Fund Advisory Committee in 1973. Originally designed to provide financial aid for transfer students, the Fund soon included scholarships for all needy students. As financial support was received, the needs expanded. This year 436 undergraduate and graduate students received over a quarter of a million dollars in financial aid.

A spin-off of the endowed scholarship fund is the proliferation of small endowed scholarships established either as a tribute to an ALS supporter or in memory of a deceased friend. The College has 43 endowed scholarships and is working on additional ones.

The largest single fund-raising effort was for the W. I. Myers Professorship Fund. Launched in 1976 and completed this year, over $750,000 was raised to endow the chair in agricultural finance.

Another popular project was the Ag Quad Beautification Project. A $20,000 goal was reached and 40 trees now adorn the Ag Quad promising the same shade and beauty as the deceased stately elms.

High-priority items for the future include:

- An even greater number of financial aid packages. As college costs rise and the enrollment of students becomes more competitive, the need for financial aid becomes a factor with many students.
- Assistantships for graduate students. An increasing number of graduate students are forced to hunt for the best offer. The attractive program, backed with a lucrative stipend, will help ALS continue to recruit the best graduate students.
- Innovative teaching programs. Seed money for new programs, new techniques, and highly specialized equipment provide for broader learning opportunities and enhanced learning experiences.
- Phase II Ag Quad Beautification. To start this year, this program will include landscaping in front of Warren Hall, Mann Library, and Plant Science and a new entrance plaza to these three buildings and to the tunnel between the Plant Sciences building and Mann Library.
- ALS discretionary fund. More than for emergencies, this fund would allow the dean and directors the opportunity to meet needs and opportunities as they arise—to be available for student, faculty, and program needs.

Cochairpersons of the Fund Advisory Committee, David Nagel of New Jersey and John Hoff of Texas, point with pride to the value of the Fund—of what is has done for the College and its potential future benefits.

Sold! The proceeds from this auction of purebred Guernseys will support education in animal husbandry and dairying at Cornell. The sizable herd was owned by Hazel B. Purcell, late wife of Robert W. Purcell, trustee emeritus and former chairman of the Cornell Board. A memorial fund will be established through Mr. Purcell's gift. (Photo: Richard Spingarn)

Further information about the Agriculture and Life Sciences Fund can be obtained from Glenn O. MacMillen, Office of Development and Alumni Affairs, 205 Roberts Hall.

The Liberty Hyde Bailey Hortorium

by DAVID M. BATES, Director

The L. H. Bailey Hortorium, a unit of the College of Agriculture and Life Sciences and the Division of Biological Sciences, is a unique institution. It arose as an outgrowth of Liberty Hyde Bailey's concern for the taxonomy of cultivated plants and is a reflection of his conviction that knowledge in basic scientific disciplines, such as botany, ought to be widely disseminated.

The Hortorium, a gift from Bailey to Cornell University, was established formally in 1935. The original gift included his library of more than 3,000 botanical and horticultural volumes, an extensive collection of nursery catalogs and seed lists, an herbarium of more than 125,000 specimens, an established botanical journal titled *Gentes Herbarum*, and even the carriage house in which the Hortorium was housed until it moved into its present quarters in Mann Library in 1953.

In founding the institution, Bailey coined the word "hortorium," defining it as "a place for the scientific study of garden plants, for their naming, for their classification, and for their documentation." The goals and philosophy he imparted in establishing the Hortorium have remained its cornerstone through the years.

The Hortorium today continues to specialize in the taxonomy of the world's cultivated flora, but the scope of its research is gradually being expanded to include the systematics of economically and ethnobotanically important plants, as well. In the future, research programs concerned with the origin and evolution of cultivated plants are planned.

With respect to its departmentally organized research programs, the Hortorium staff and outside contributers have recently completed *Hortus Third*, a dictionary of plants cultivated in the United States and Canada.

This encyclopedic book, published by Macmillan in 1976, is 1,290 pages long. It includes over 25,000 descriptions of plant species, genera, and families, as well as many cross-referenced synonyms, general botanical and horticultural articles, illustrations, and indices.

Hortus Third has been widely acclaimed. The Hortorium has been awarded a Certificate of Merit by the Pennsylvania Horticultural Society, a Silver Medal by the Massachusetts Horticultural Society, and a Medal of Honor by the Garden Club of America.

The production of a second major reference work is now underway. A revision and expansion of Bailey's widely used *Manual of Cultivated Plants*, this new work will permit botanists, horticulturalists, and other plant scientists to easily identify and properly name the vast majority of the world's cultivated flowering plants. (It would be tempting to say *all* of the world's cultivated plants, but that is a practical impossibility, since any wild species on occasion might be brought into cultivation.)

Although the publication of reference books in horticultural systematics is one goal of the Hortorium, it should be stressed that publication is only one element of a continuing research program. In conjunction with *Hortus Third*, for example, the staff of the Hortorium published over 500 scientific papers, notes, and reviews. Many of these have appeared in *Baileya*, the Hortorium's journal of horticultural taxonomy, which is now in its twentieth volume.

In addition to participating in group projects, each faculty member carries on his or her own research program. Best known among them are the studies in palm biology conducted by Dr. Harold E. Moore, Jr., the Liberty Hyde Bailey Professor of Botany, and his collaborator, Dr. Natalie W. Uhl. Other research programs, involving techniques ranging from the biochemical to the statistical, deal with the aster, poinsettia, orpine, and nightshade families.

Of equal importance to its research efforts is the Hortorium's role in the academic life of the University. The faculty of the Hortorium teach a variety of courses in systematic botany, including introductory and advanced offerings in the systematics of wild and cultivated vascular plants, botanical Latin, plant nomenclature, and families of tropical flowering plants. The latter is given in Costa Rica during the winter intersession. Teaching responsibilities also include *Plants and Human Affairs*, a general course combining elements of ethnobotany, economic botany, and anthropology.

The facilities that support the research, teaching, and extension programs of the Hortorium rank it among the nation's major university museums. The herbarium, which essentially is a collection of dried and mounted plant specimens, numbers 712,523 specimens, which have been derived from two principal sources.

One source or collection, the nucleus of which was Bailey's personal herbarium, has grown with the Hortorium and now numbers 388,671 specimens. This collection is worldwide in scope, with major emphasis on plants of ornamental and economic importance and their wild progenitors, on plants of ethnobotanical interest, and on families of special staff interest. Notable strengths of this collection are the significant representation of cultivated plants, plants of Japan, members of the raspberry and grape genera, and above all else, specimens of palms—which are certainly the most extensive in the world.

The other collection, now integrated with that of the Hortorium, is the Wiegand Herbarium, named in honor of Professor Karl M. Wiegand. This herbarium traces its origins to 1869, when Andrew D. White purchased the private herbarium of Horace Mann, Jr.

The herbarium eventually became part of the Department of Botany in the College of Agriculture and Life Sciences and, in 1977, it became part of the Hortorium.

In large measure, the specimens in the Wiegand Herbarium reflect the systematic interests, exclusive of those in the fungi, of Cornell botanists through the years. Although the herbarium, which numbers 323,852 specimens, is also worldwide in scope, its principal focus is on the eastern United States, especially the glaciated Allegheny Plateau and the Cayuga Lake Basin. Groups strongly represented are the mosses, especially *Sphagnum*; ferns; legumes; grasses and sedges; and the stonecrop genus, *Sedum*.

Bates in the conservatory of the Hortorium.

Equal in importance to the herbarium specimens are the extent and quality of reference works in systematic botany found in the Hortorium. The Hortorium has a library numbering in excess of 12,000 volumes, as well as what is perhaps the largest collection of nursery catalogues and seed exchange lists in the United States, a voluminous collection of catalogued separates, and various ancillary indices. These holdings, together with those of the Cornell University library system, give the Hortorium access to one of the nation's richest sources of botanical literature.

For more information about the activities and resources of the Bailey Hortorium, write to David M. Bates, L. H. Bailey Hortorium, 467 Mann Library, Cornell University, Ithaca, New York 14853.

W.I. Myers Professorship Fully Endowed

The W. I. Myers Professorship of Agricultural Finance is now the first fully endowed chair in the College. At the banquet commemorating the 75th anniversary of the College's affiliation with New York State, Dean David L. Call announced that the $750,000 goal had been reached.

The chair is a memorial to William Irving Myers, former dean of the College of Agriculture and Life Sciences. Myers was a professor of farm finance at Cornell for 23 years before becoming dean, a position he held until 1959.

He was also the principal architect of the national farm credit bank system, which provided the framework for recovery from the Great Depression. It remains the foundation on which institutions of agricultural finance are built today.

Myers was appointed second governor of the Farm Credit Administration by President Franklin D. Roosevelt. He advised Presidents Truman and Eisenhower in the field of agricultural finance, as well as New York State governors, the State Legislature, and numerous commissions, committees, foundations, and businesses.

Endowment for the chair has come from foundations, financial institutions, and other enterprises concerned with agriculture. Faculty, alumni, and friends have also participated generously in this tribute.

Holders of the W. I. Myers Professorship will be able to work unhindered by financial pressures. The chair's occupants will also attract outstanding junior faculty and students.

A search is now underway for the first full-time W. I. Myers Professor.

The effects of ozone pollution on grapevines are closely monitored in these chambers.

Is Ozone Pollution Sour Grapes?

This is what oxidant stipple can do to a grape leaf. The damage interferes with photosynthesis, depriving the grapes of some sugar.

Amidst this country's urgent search for energy sources comes an inevitable confrontation with Mother Nature. Burning synthetic fuels and more coal may loosen OPEC's grip, but it may also further contaminate our air and water. It may exact a higher toll from our crops, too, as leaves wither under the strain of ozone poisoning.

When nitrogen oxides and hydrocarbons, two by-products of fossil-fuel combustion, are exposed to sunlight, a chemical reaction forms ozone. This gas, most noxious in humid and stagnant air, infiltrates the leaves of plants, dotting them with brown flecks that inhibit the process of photosynthesis.

The condition is known as oxidant stipple and is especially worrisome to pomologist Walter Kender, who for over a decade has been studying the effects of this kind of air pollution on grapes.

Ever since the mid-1960s, when growers noticed that their vines were losing leaves for no apparent reason, Kender has been at the forefront of efforts to identify the cause and reduce its effect on New York's $35 million grape industry.

"Of the many kinds of pollutants that originate from various sources and have different effects on crops," says Kender, chairman of the Department of Pomology, "ozone is the most prevalent and the most destructive. It has the potential to wipe out an entire season's crop of some of the most popular varieties."

The Concord grape, among the most susceptible to oxidant stipple, is the most common variety used in grape juice. Ives grapes, which have consistently brought the highest prices per ton, are in danger of being discontinued in some vineyards because the disease often damages most of the vines.

When oxidant stipple strikes, the grapes are harder to sell because they are not as sweet as those from unafflicted vines. Sugar content can run several percentage points below the 15 percent mark insisted upon by large fruit juice processors such as Welch. Fortunately, wine production is unaffected because sugar is routinely added as part of the wine-making process.

Oxidant stipple is not by any means isolated to New York State. Other places around the Great Lakes, including Pennsylvania, Ohio, Michigan, and Ontario, are also plagued. And it is this region that produces 94 percent of the grapes grown in eastern North America.

"There are some varieties that are heavily damaged by ozone, and there are some that show no ill effects at all," says Kender, who has conducted his intensive research in Ithaca, at the Agricultural Experiment Station in Geneva, and at the Vineyard Laboratory in Fredonia, New York. "European varieties show almost complete resistance to oxidant stipple, as do the varieties of European origin grown in California."

Proving that ozone did indeed directly cause oxidant stipple was Kender's first task. When grape vines were exposed to high concentrations in the laboratory, the leaves stippled almost immediately. So much for the lab. But would he get similar results in the field?

At the Vineyard Laboratory in Fredonia, Kender and his close associate in this project, Robert C. Musselman, have set up 12 chambers that control the amount of pollution to which plants are exposed. The circumference of these cylinders is lined with clear plastic that lets in a normal amount of sunlight. The tops, however, are left open to avoid a greenhouse effect.

Some of the chambers are fitted with charcoal filters that effectively cleanse the vines' environment of all contaminating gases. Others are equipped with filters that keep out small foreign particles. Some chambers have both filters, and others have none at all.

Over a period of four years, vines grown with the charcoal-purified air had much less oxidant stipple than those without. From 1973 to 1976, fewer than five percent of the leaves in filtered chambers showed any sign of the disease. A full 58 percent were afflicted when their environment was not controlled.

This evidence has spurred some grape growers to action. A few years ago Niagara Mohawk Power Corporation, a public utility serving much of Upstate New York, applied for state approval to build a fossil-fuel power plant on Lake Erie. Nelson J. Shaulis, now professor emeritus of pomology and viticulture at the Geneva Station, along with Kender and some irate farmers, helped persuade officials to deny the request.

Niagara Mohawk, which funded much of this early research, then cut off all their support for Kender's project, which, he says, must be continued for at least five more years. "There are so many differences in growing conditions from year to year that our findings cannot be considered completely valid unless they are the product of at least ten years of research," he explains. "There is an urgent need for long-term data."

Grape growers and other representatives of New York's grape industry are also convinced of the value of Kender's work. The State Legislature recently passed an appropriations bill that assures continued funding for the project.

This money will not only finance further testing of ozone and oxidant stipple, but will help Kender find ways to reduce its toll on the grape harvest. "It will take an effort on an international level to stop the ozone pollution," he remarks, "so the only immediate answer is to treat the effects."

Indeed, even if a vineyard is in an area free of heavy industry, ozone can be present in concentrations harmful to humans. In fact, Upstate New York imports most of its ozone from the Midwest. Air currents carry it northeasterly and through Detroit, Cleveland, and Buffalo, where its intensity grows. It does not stop in New York, though. Before the gas finally moves out to sea off the Virginia coast, it circles southward, blanketing most of the mid-Atlantic.

So far, Kender has urged growers to select well-drained soil and to apply recommended amounts of nitrogen. He also advises using the fungicide benomyl to protect the vines. Fortunately, these precautions are accepted, common-sense practices that promote healthy yields for all types of grapes, even those resistant to oxidant stipple.

Another aspect of the quest, led by Dr. Robert Pool at the Geneva Station, is an attempt to actually breed the disease out by creating new varieties. Since many kinds of grapes are not susceptible to oxidant stipple, it is at least theoretically possible to develop hardier vines that will bear fruit that is every bit as sweet, succulent, and savory as the varieties they replace.

Ozone pollution is a problem for which there is no easy or likely solution. And, what with the prospect of burning dirtier fuels and more of them, grapes and, for that matter, many other crops are sure to suffer. Only through bold programs to learn more about this poison and manage its effects will the threat abate.

Faculty in Brief

Awards

Harry R. Ainslie, dairy extension leader, was awarded the 1979 De Laval Extension Award for his contributions to the dairy industry. His work with the dairy herd improvement program in New York State has become a model for several other states.

Gerald F. Combs, Jr., assistant professor of animal nutrition, won the 1979 Poultry Science Research Award, which recognizes outstanding research published in *Poultry Science*, the journal of the Poultry Science Association.

Howard E. Conklin, professor of land economics, has been recognized by the American Agricultural Economics Association for his superior contributions to rural land policy.

Leroy L. Creasy, professor of pomology, was elected president of the Phytochemical Society of North America for a one-year term. The society is dedicated to the promotion of scientific study in plant biochemistry.

Robert W. Everett, associate professor of animal science, received the 1979 research award from the National Association of Animal Breeders in recognition of his research and service in the field of dairy herd production.

Danny G. Fox, associate professor of animal science, received the Young Scientist Award given annually by the Northeast Section of the American Dairy Science Association and the American Society of Animal Science. Fox is a specialist in beef production and is responsible for the beef cattle extension program in New York.

William Hansel, the Liberty Hyde Bailey Professor of Animal Physiology, received the 1979 Morrison Award of the American Society of Animal Science. This award is given to one ASAS member each year on the basis of recent outstanding research of direct importance to livestock production.

Neal F. Jensen, the Liberty Hyde Bailey Professor of Plant Breeding, Emeritus, has been awarded a Fulbright-Hays Award to lecture and conduct research on wheat genetics at the Plant Breeding Institute of the University of Sydney, Australia.

Robert W. Langhans, professor of floriculture, was the recipient of the M.A. Blake Award for Distinguished Graduate Teaching. The award was presented at the 76th Annual Meeting of the American Society for Horticultural Science in recognition of Langhans' contributions to the profession and to teaching.

William E. Mai, professor of plant pathology, received an Award of Distinction at the 9th International Conference of Plant Protection. The award honors work of importance to science and to society.

Robert E. McDowell, professor of international animal science, received the International Animal Agriculture Award from the American Society of Animal Science. He is recognized internationally for research in environmental physiology and on cross-breeding in dairy cattle, which has been of great value both in the United States and in developing countries.

Gerald E. Rehkugler, professor of agricultural engineering, and coauthors A.K. Srivastava and B.J. Masemore, earned an ASAE Paper Award of the American Society of Agricultural Engineers. Out of a select group of 242 papers published in the society's journals, only eight were chosen for awards, on the basis of their engineering merits.

Kenneth L. Robinson, the Liberty Hyde Bailey Professor of Agricultural Economics, was elected a Fellow of the American Agricultural Economics Association. Robinson is well known for his teaching, research, and extension work on agricultural policy and prices and is coauthor of the popular text *Agricultural Product Prices*.

John G. Seeley, professor of floriculture emeritus, was named to the Floriculture Hall of Fame at the convention of the Society of American Florists. Election to the Hall of Fame honors at least 15 years of dedicated service to the floral industry.

Harold B. Tukey, professor of ornamental horticulture, was one of 14 members of the American Society of Horticultural Science to be elected a Fellow of the Society. He is known worldwide for his work on foliar nutrition, growth regulation, and propagation of ornamental plants.

Kenneth L. Turk, professor of animal science, emeritus, was named the 1979 Honorary Fellow of the American Society of Animal Science.

Robert R. Zall, professor of food science, was honored with a Certificate of Appreciation by the regional office of the Environmental Protection Agency. The award recognizes his contributions to a better environment, which include designs for a new technique for cleansing milking equipment that saves energy, detergent, and water.

The following professors were named emeritus by the Cornell University Board of Trustees:

John M. Anderson
C. Arthur Bratton, agricultural economics
Edward O. Eaton, agricultural engineering
Louis J. Edgerton, pomology
Royse P. Murphy, plant breeding
Walter J. Pauk, education
Harry W. Seeley, Jr., microbiology
Raymond Sheldrake, Jr., vegetable crops

The following faculty members were promoted from associate professor to professor, effective July 1, 1979:

Joseph M. Calvo, biochemistry
A. Jane Gibson, biochemistry
Harold F. Hintz, animal nutrition
William G. Merrill, animal science
W. Shaw Reid, agronomy
Richard B. Root, insect ecology (2/1/79)
Peter L. Steponkus, crop physiology

The following faculty members were promoted from assistant professor to associate professor, effective July 1, 1979:

David K. Bandler, food science
John H. Peverly, agronomy

New department chairmen since July 1, 1979:

Eugene Erickson, rural sociology
John B. Heiser, Shoals Marine Laboratory
Roy L. Millar, plant pathology

New professors:

Robert Barker, professor of biochemistry and Director, Division of Biological Sciences
Paul W. Barkley, agricultural economics

New associate professor:

Thomas A. Zitter, plant pathology

New assistant professors:

James A. Bartsch, agricultural engineering
R. Dean Boyd, animal science
LeRoy A. Ellerbrock, vegetable crops
Patricia Garrett, rural sociology
Charles C. Geisler, rural sociology
Elizabeth A. Oltenacu, animal science
Ronald E. Ostman, communication arts
Barbara L. Peckarsky, aquatic entomology
A. Martin Petrovic, floriculture and ornamental horticulture
Anthony M. Shelton, entomology (Geneva)
Loren W. Tauer, agricultural economics
Richard W. Tenney, education
Donald R. Viands, plant breeding

Died on June 14, 1979:

R. C. Cetas, professor of plant pathology

The following new grant awards have been reported since February 1979:

Kraig Adler, neurobiology and behavior—NSF, "Homing in juvenile American alligators." $9,800

——— . NSF/DD, "Research in population biology." $2,990

——— . NSF/DD, "Determinants of schooling behavior in anuran larvae." $3,695

James R. Aist, plant pathology—NSF, "Cell wall appositions and plant disease resistance." $60,000

Martin Alexander, agronomy—Internatl. Inst. Tropical Agriculture, "Maximizing nitrogen fixation by cowpeas and soybeans in farming systems in the humid tropics." $262,800

David K. Bandler, food science—NYS Agr. & Mkts, "Program to increase the acceptance of fresh fluid milk." $30,000

David R. Bouldin, agronomy—USDA/SEA, "Improving nitrogen fertilizer recommendations in NYS." $56,000

——— . U.S. Dept. Interior, "Water resources investigations." $6,500

Frank J. Bourke, food science (Geneva)—SEA, "Glyphosate residue found in strawberry fruit." $1,500

Robert L. Bruce, education—USDA-Internatl. Cooperation & Development, "International Agriculture Training." $17,000

Jeffrey M. Camhi, neurobiology and behavior—NSF, "Plasticity in invertebrate nervous systems." $180,603

Harold R. Caponer, rural sociology—EPA, "Hudson River watershed." $3,000

——— . EPA, "Toxic substances public participation program." $3,000

Roderick K. Clayton, botany—NSF, "Photosynthetic energy conversion." $40,000

Eddie W. Cupp, entomology—USDA/SEA, "Life table studies of laboratory-reared blackflies." $8,100

William B. Duke, agronomy—USDA/APHIS, "Survey of noxious weeds." $15,000

Charles J. Eckenrode, entomology (Geneva)—USDA/TPSU/NYSAES, "Potato leafhopper/snap bean yield." $21,930

Stuart J. Edelstein, biochemistry—HEW, "Structure of fibers of sickle cell hemoglobin." $186,875

——— . NSF, "Quaternary inter. in proteins." $150,000

Gerald R. Fink, botany—HEW, "Predoctoral training in genetics." $519,500

Olan D. Forker, agricultural economics—NYS Agr. & Mkts., "Dairy promotion." $161,266

Daryle E. Foster, education—SED, "Development of curriculum materials." $39,879

A. Jane Gibson, biochemistry—NASA, "Phylogeny of photosynthetic bacteria." $9,363

Peter Gregory, plant breeding—USDA, "Chemical mechanisms of insect resistance in wild potato germplasm." $88,000

Glenn Hausfater, neurobiology and behavior—HEW, "Integrative approach to neurobiology and behavior." $613,535

George W. Hudler, plant pathology—Int. Soc. of Arb., "Anatomy and physiology of girdling roots." $1,000

William J. Jewell, agricultural engineering—Special Grant, "High rate biological production of alcohol from agricultural by-products." $118,513

John E. Kinsella, food science—NSF, "Regulation of phospholipid synthesis in animals." $153,731

Eddie L. LaDue, agricultural economics—USDA/ESC, "Analysis of Farmers Home Administration farm lending program." $57,000

Alan N. Lakso, pomology (Geneva)—Penn State University, "Crop loss in grapes caused by powdery mildew." $24,358

——— . USDA/CR, "Decreased pesticide use in orchards." $4,000

Joseph F. Metz, international agriculture—AID, "Title XII strengthening grant." $500,000

Roger A. Morse, entomology—NIH, "Vespid venom collection." $111,615

Karl J. Niklas, botany—NSF, "Paleobiochemistry of fossil angiosperms." $31,500

David Pimentel, entomology—NSF, "Population ecology of the genetic feedback mechanism." $118,000

Joe Regenstein, poultry science—USDA/NOAA, "Elimination of formaldehyde formation in red hake." $30,319

Wendell L. Roelofs, entomology (Geneva)—Michigan, "Spruce budworm pheromones." $14,480

Roger F. Sandsted, vegetable crops—NYS Dry Bean Assn., "Dry bean grant." $2,000

David M. Soderlund, entomology (Geneva)—NIH, "Pyrethroid action." $71,842

Roger Spanswick, botany—NSF, "International workshop on membrane transport in plants." $10,000

David M. Stipanuk, agricultural engineering—Power Authority of NYS, "Construction and operation of a greenhouse using plant waste heat." $51,000

James R. Stouffer, animal science—Research Fdn. of SUNY, "Body composition determined by ultrasound in patients with neoplasia." $35,979

Ari VanTienhoven, poultry science—NSF, "Periodicity of locomotion and temperature." $54,819

L. Dale VanVleck, animal science—USDA/SEA, "Factors affecting the reproductive efficiency of sheep." $7,100

Donald H. Wallace, plant breeding—NYS Dry Bean Assn., "Dry bean grant." $3,500

Michael F. Walter, agricultural engineering—Shaklee, "Poly(ethylene oxide)-based polymers." $22,531

Christopher F. Wilkinson, entomology—NYS Dry Bean Assn., "Dry bean grant." $4,000

Robert J. Young, animal science—Dreyfus Fdn., "Nutrition and reproductive performance in dairy cattle." $25,000

———SEA, "Optimal utilization of nutrients from forage by high producing dairy cows." $92,400

Stanley A. Zahler, botany—NSF, "Gene transfer by *Bacillus subtilis* bacteriophage SP(BETA)." $172,000

75th Anniversary
Continued from page 2

He said zoning separates people by classes, and this causes social tensions and crime.

Trends in Plant Science

It is in the plant sciences that many of the College's contributions to agriculture and food production have become most obvious to both farmers and consumers. Durward F. Bateman, former chairman of the Department of Plant Pathology, Vernon E. Gracen, professor in the Department of Plant Breeding and Biometry, and Edward H. Smith, chairman of the Department of Entomology, discussed some of the College's accomplishments in the plant sciences, as well as current research and future challenges.

Bateman pointed out the innovations that have helped accelerate progress in agriculture, including techniques for extending the storage life of onions, potatoes, and apples and making them available to consumers the year round. A new development in grape culture, called the Geneva double-curtain system, has the potential of boosting yields by as much as 50 percent.

In the never-ending war against plant diseases, insect pests, and troublesome weeds, Cornell scientists pioneered the method of producing disease-free plant stocks. Bateman said the technique known as culture indexing literally saved the nation's chrysanthemum industry from destruction in the 1950s and is now applied to other important crops. Also noteworthy was the research leading to quarantines to help control the destructive golden nematode. This work has been invaluable to New York's multimillion-dollar potato industry.

New approaches in pest control were also discussed. Natural resistance, biological control, and chemicals are used in an integrated pest management system which, Gracen said, may lead to an economical, environmentally safe, and effective means of pest control (ALS *News*, November 1978).

In his talk, Smith cited the pressures created by population growth, the demand for more food, and greater competition for energy.

"As these pressures mount, our ability to improve the technology of production is not keeping pace," he said. To meet this enormous challenge that has such serious implications for international harmony, new breakthroughs will be required in the efficiency of plants.

"The College faces these challenges with a deep sense of commitment, which is strengthened by our tradition of leadership and excellence," he said.

Last summer's Alumni University students learn about planting trees at Cornell Plantations. The Plantations consists of 2,600 acres of gardens and forests that not only heighten campus beauty, but serve as a year-round natural laboratory for teaching horticulture. (Photo: Russell Hamilton)

Letters to the Editor

Dear Editor:

The fact that the *Chronicle of Higher Education* suddenly discovered that Cornell's faculty of the College of Agriculture and Life Sciences is number one in the nation comes as no startling news to those of us fortunate enough to have been your students.

There is no single accomplishment in my lifetime that has meant as much as my Ph.D. from the Entomology Department at Cornell. I will continue to take great pride in my Cornell degree and my association with the Division of Biological Sciences.

The outstanding quality of the faculty of Agriculture and Life Sciences guarantees that the long-standing tradition of excellence will continue.

Robert S. Marshall
President, Daemen College
Amherst, New York 14226

Dear Editor:

I have received the November 1978 issue of *Agriculture and Life Sciences News* and I have been happy reading all of its contents. I am keenly interested in this publication and I wish you to continue mailing it to me regularly so that I can keep informed with what goes on in our Alma Mater.

Nicolas T. Theodorou
Athens, Greece

Dear Editor:

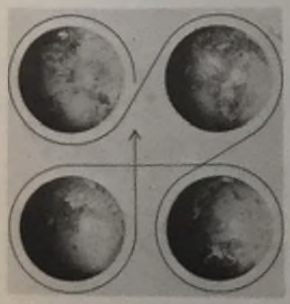
Reading the April *ALS News* gives one much food for thought. Almost the entire issue interested me but in particular I was drawn to the article "Controlling Lawn Weeds" by Arthur Bing.

Of the eight weeds pictured, five of them are included in our diet, either cooked or in salads. Dandelion is an old favorite and the entire plant can be used (flowers for wine, root as a coffee substitute). Broadleaved plantain, wild onion (wild garlic), chickweed and red sorrel (lemon grass) are used to a lesser extent. Clover of course is a legume and is attractive in lawns and other places, a favorite of honeybees. Crabgrass and prostrate knotweed indicate to me light or infertile ("poor") ground and probably the soil is better suited to something else, fruit or nut trees, or potatoes. Winter cress is another common weed which is probably high in food value judging by its deep green color.

I would also be interested in the long-range effects of herbicides on soils. For instance, I have observed that where continuous corn was grown in conjunction with weed and grass killers, the soil is firm ("packed") and is lacking in life (spec., earthworms). The corn crop, however, was excellent. Has research or observation accummulated on this phenomenon? This is not intended as criticism of the article, but only further information.

Glenn Fisher '51
Minisink Hills, PA

World Food Issues



The history of the world is replete with stories of man's successes and failures in feeding himself and those around him. The problems of growing enough nutritious food—both crops and livestock—continue to confront us today. The potential of existing sources offers hope for the future. But some hard decisions will have to be made.

In *A Series of Papers on World Food Issues*, various aspects of the world food situation are discussed. The 14 illustrated essays, written by Cornell faculty, fall into two categories. The first group deals primarily with food production and natural resources—land, climate, water management; crop improvement and protection; the role of animals; and energy use.

The second group outlines the policy issues—nutrition; technology transfer; education and extension; land tenure; export versus domestic production; and international food aid.

References and discussion questions are given at the end of each paper. A separate annotated bibliography is also included.

The series deals with issues as objectively as possible, in a language appropriate for university classes and other interested groups.

Copies cost $2 each and are available from: Distribution Center, 7 Research Park, Cornell University, Ithaca, New York 14850.

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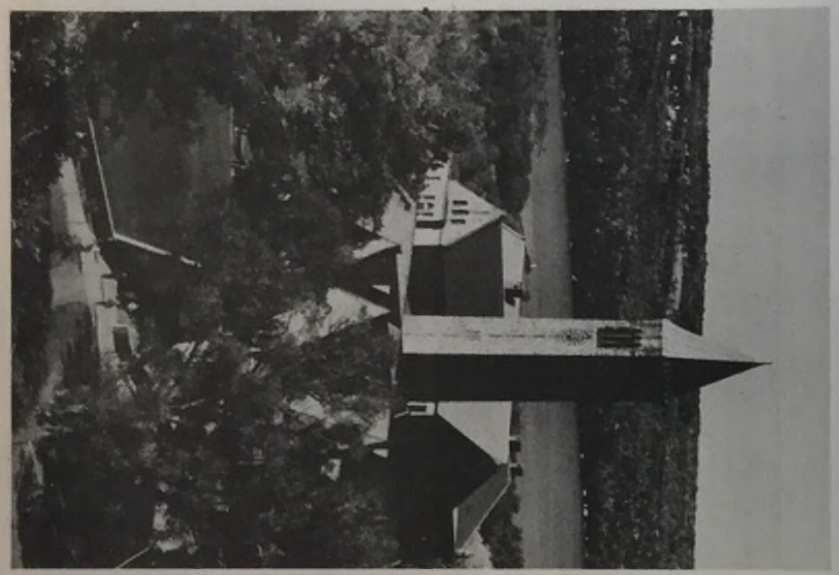
Dean:
David L. Call
Assistant to the Dean:
Glenn O. MacMillen
Editor:
Richard A. Spingarn
Design:
Laura M. Cicchetti
Technical Editor:
Marilee Rist
Production Coordinator:
James A. Mason



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NOVEMBER 1979

College to Construct Two New Buildings

Two new buildings containing laboratories, classrooms, and offices will be constructed for the College of Agriculture and Life Sciences by the State of New York, President Frank H. T. Rhodes announced last week. Call said that a building for entomology laboratories and biology classrooms is to be constructed on Lower Alumni Field and [illegible] a structure [illegible] fices, the [illegible] Program, Media Services, and the Departments of Education and Communication Arts will replace Roberts, Roberts, and Stone Halls.

In the [illegible] more than a year ago, the entomology building was to be on the Agriculture Quadrangle in the open space between what is now the Roberts [illegible] Caldwell [illegible] Lower Alumni [illegible] and will remain open. The structure will also be close to the new biology building scheduled for construction

ing this fall. The location is bound to be convenient for students and faculty alike.

The [illegible] close study by College and University administrators. The buildings were constructed in the early part of this [illegible] and [illegible] the [illegible] tration. Two organizations, Historic Ithaca and the Ithaca Landmarks Preservation Commission, had [illegible] conclusion that our most responsible position is to request demolition of Roberts, East Roberts, and Stone. [illegible] are just too high."

According to Call, remodeling to meet state standards would cost $9

$10 per square foot more than building from the ground up. The minimum additional cost would be [illegible]

The high price of remodeling may be hard to understand, considering that the basic shell would already be [illegible] efficiency for academic buildings far much easier to meet with new construction.

For [illegible] spaces. The walls would [illegible] to be reconstructed to hold at least four more inches of insulation. This is not [illegible] replaced, and combustible materials in major structural parts are not permitted.

"[illegible] long and hard before asking for an exemption from an energy code." Call said. "And, I will not apply for it [illegible] perfect life and [illegible]

[illegible] of Entomology [illegible] Comstock and Caldwell, those buildings will be given to Cornell by the state and they will be used to house collections and [illegible] reference materials. Call estimated that construction on the entomology building will begin in the spring of 1981. It will have 55,400 square feet of floor space. The demolition of the Roberts complex [illegible] spring of 1983. The [illegible] will have over 61,000 square feet.

"We will do everything in our power to preserve the integrity of the Quad," Call emphasized. "Some [illegible] features of [illegible] seal on the roof above the main door, will be preserved and probably incorporated into the new construction."

Is Ozone Pollution Sour Grapes?

The L. H. Bailey Hortorium

Frogs Listen Before They Leap

Energy Efficiency On The Farm

Bob Foote - Bullish On Breeding

The 75th Anniversary– The Festivities and the Forums

Dean Call chats with Mr. and Mrs. Mynor Fuerst during the anniversary reception.

More than 3,000 people attended the 75th anniversary celebration of the New York State College of Agriculture and Life Sciences on May 12. Tours of College facilities, and exhibits of its contributions to agriculture, began the day commemorating the College's 75-year affiliation with the State of New York and its extraordinary history of innovation and success.

After an afternoon of faculty forums covering subjects from agricultural economics to food science, the day culminated in a reception and banquet attended by more than 1,000 guests.

Cornell President Frank Rhodes and Clifton R. Wharton, Chancellor of the State University of New York, were the keynote speakers. A special resolution adopted by the N.Y.S. Legislature honored Provost W. Keith Kennedy, former dean of the College, for his dedicated service and leadership in agriculture. All of the food and beverages were produced in New York State.

Although most of the day's activities were decidedly festive, some serious subjects were tackled by faculty during three-and-a-half hours of lectures and symposia.

Inflation and Agriculture—What's Ahead?

Cornell agricultural economists noted an unwillingness among Americans to confront the causes of inflation and characterized it as an economic game of chance with each group trying to pass its losses off to another.

"Inflation persists because no one wants to take a cut in income," said Kenneth L. Robinson, Liberty Hyde Bailey Professor of Agricultural Economics. "We are unwilling to accept the consequences of a no- or slow-growth economy, but inflation will persist as a way of forcing us to do involuntarily what we are unwilling to do collectively—that is, to cut back on our purchases of goods and services.

"Everyone is fighting for a larger share of an economic pie that is no longer growing at the rate it did five or ten years ago. Our expectations are still influenced by an era in which real income per capita increased at a rate of 20 to 30 percent each decade, which it did from about 1939 to 1973," he noted.

Robinson said although inflation

Continued on page 2