

CORNELL CHRONICLE

Volume 22 Number 15 December 13, 1990

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Pressures greater than Earth's core reached here

Within a hair-thin chamber squeezed between two flawless diamonds, static pressures greater than those at the center of the Earth have been achieved for the first time by Cornell materials scientists.

The development will allow scientists to produce and study new forms of solids that do not exist at normal pressures. Such studies could yield better basic theories of chemical bonds and the behavior of electrons in solids.

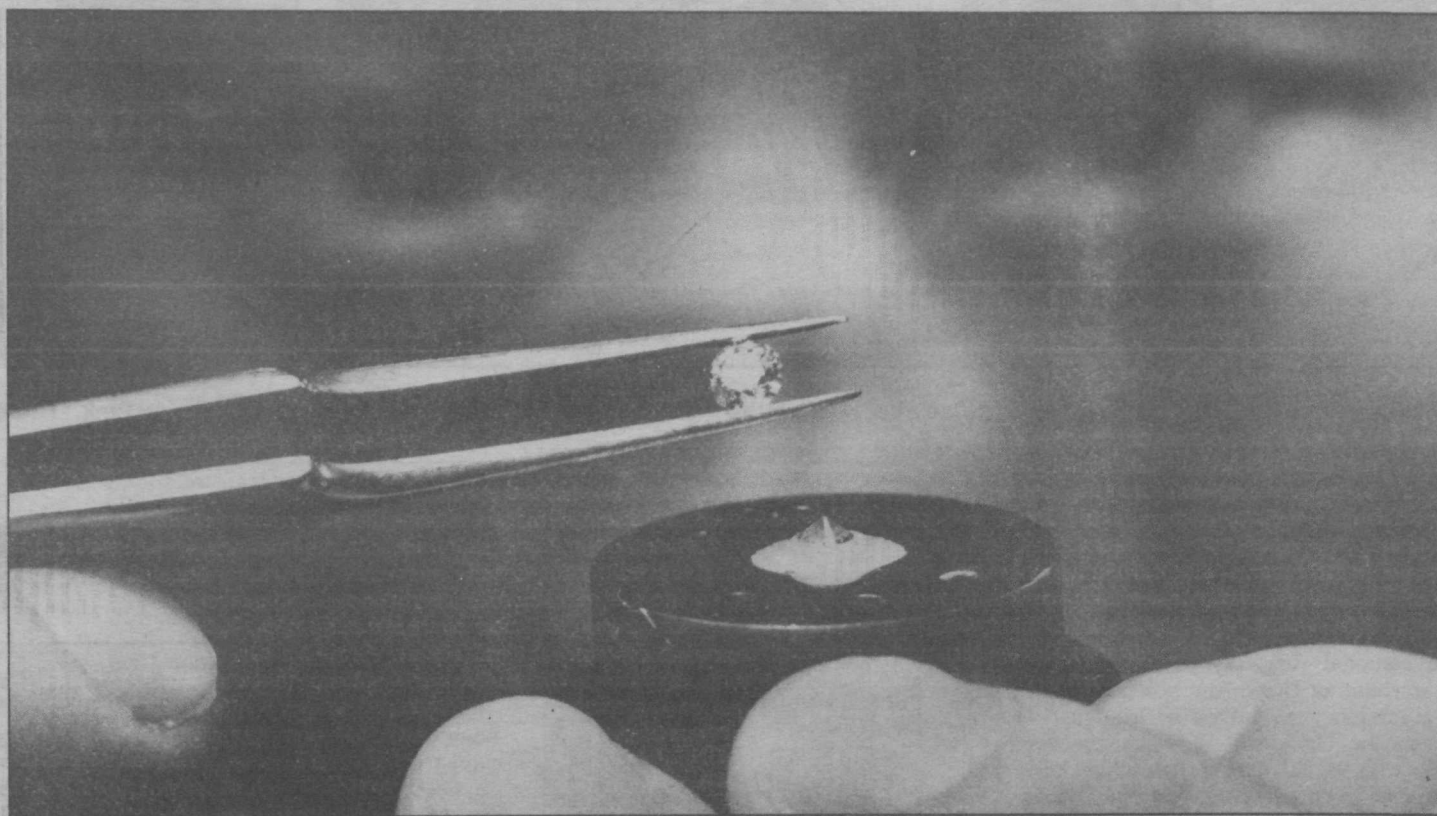
The ultrapressures will also facilitate insights into the structure of the Earth and other planets, according to the scientists.

In a scientific paper in the December issue of the Review of Scientific Instruments, the researchers describe using an apparatus known as a diamond anvil cell to reach pressures more than 4,000 times greater than the pressure at the deepest spot in the ocean.

The pressure they reached was 4.16 megabars, while the pressure at the center of the Earth is about 3.6 megabars. One megabar is about 980,000 times sea-level atmospheric pressure.

Reporting the experiments were Professor of Materials Science and Engineering Arthur Ruoff, graduate students Hui Xia and Huan Luo, and Assistant Professor of Materials Science and Engineering Yogesh Vohra.

Other research groups have achieved instantaneous pressures far higher — up to 100 megabars — in shock experiments using special gas cannons or nuclear explo-



Chris Hildreth

Graduate student Hui Xia displays the diamonds that were used to attain the highest static pressures yet achieved — greater than the pressure at the Earth's center. The bottom diamond is mounted in part of the apparatus used to hold the diamonds, tip-to-tip, as they are squeezed to produce the high pressures in a tiny chamber between the tips.

sions. However, the extremely high temperatures and fleeting nature of those experiments do not allow study of the structure of the compressed substances using lasers, X-rays and other probes.

The diamond anvil cell is widely used to achieve high pressures for long periods of time and with samples of a size that can be analyzed. The device typically consists of a pair of brilliant-cut diamonds, chosen for their crystal perfection, each with a minuscule flat area polished off its tip. The diamonds are mounted tip-to-tip, and a tiny

steel gasket with a hole drilled in the middle is placed between them. The substance to be tested is added to the hole and the diamonds are mounted within a powerful vice and clamped together using a series of screws.

The Cornell scientists achieved the highest static pressures ever by using diamonds with especially small tips of about 20 micrometers, or about one-fifth the diameter of a human hair. (A micrometer is one-millionth of a meter.) The scientists obtained the specially cut one-third-carat dia-

monds from the diamond merchant D. Drukker & ZN of the Netherlands.

The sample hole in the steel gasket was even smaller — 10 micrometers, or about one-tenth the diameter of a hair and a few micrometers thick. The researchers produced the tiny sample chamber by drilling through the steel with a 10-micrometer-diameter carbide drill.

The Cornell scientists used tungsten and molybdenum as test substances in the sample chamber, because their physical

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Assemblies to seek views on transit plan

The assemblies will hold a series of hearings in January to gather campus views on Cornell's plan to discourage single-occupant automobile commuting while encouraging the use of public transit, biking and walking.

The general outline of the plan has been decided, its provision of free bus passes has begun, and the university's subsidy for parking and traffic has been fixed at \$900,000 for the year starting next July 1.

But, as Senior Vice President James E. Morley Jr. told a recent public meeting of the assemblies, the administration still welcomes suggestions about details of the plan, which goes fully into effect in July.

In an effort to stimulate campus suggestions, the chairmen of the University Assembly, Student Assembly and Employee Assembly have sent an open letter to the campus announcing January meetings (at dates not yet set) and seeking reaction "in order for the assembly system to function to its fullest potential as we confront these issues facing the entire campus community."

The letter, also signed by the co-chairmen of the University Assembly's Commit-

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Charles Harrington

Wesley Sand (left), one of 32 Rhodes scholars named this year, has participated in studies of bovine growth hormone led by Professor Dale Bauman. Sand will study philosophy, economics and politics while at Oxford.

Ag student wins Rhodes scholarship

A 21-year-old animal-science major who bought his first cow when he was still a child has been named one of 32 Rhodes scholars, American students chosen for two-year fellowships at Oxford University.

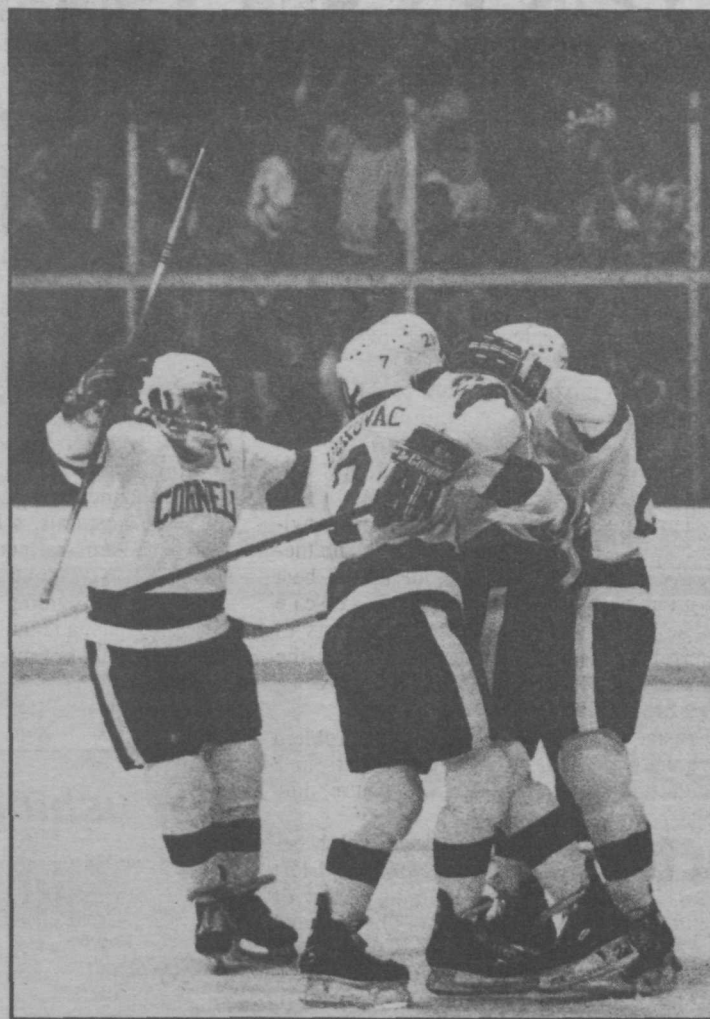
Wesley Sand was still in elementary school when he bought his first beef cow with \$400 he earned working on his family's farm one summer. By the time he left for Oregon State University, where he spent the first two years of his college career, his herd had grown to five cows, as many calves and one bull.

At Cornell, Sand has worked on high-profile agricultural research; and at Oxford, he plans to study philosophy, economics and politics. Ultimately, however, he plans to return to Oregon and to work in some area of agriculture policy.

The family farm where Sand got started is in Roseburg, Ore., a town of

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Ice breaker



Hockey co-captain Doug Derraugh celebrates after scoring the first goal of the night against Yale Dec. 7 at Lynah Rink. The Big Red defeated the Elis, 4-2.

Photographs by Charles Harrington

Arbitrator group moves to Ithaca

The National Academy of Arbitrators, an organization of North America's leading labor arbitrators, has moved its headquarters from the University of Michigan to Cornell, with the support of the School of Industrial and Labor Relations.

"We are generally recognized as the leading organization of arbitrators by all who are in our profession," said Dana Edward Eischen, the academy's executive secretary and treasurer.

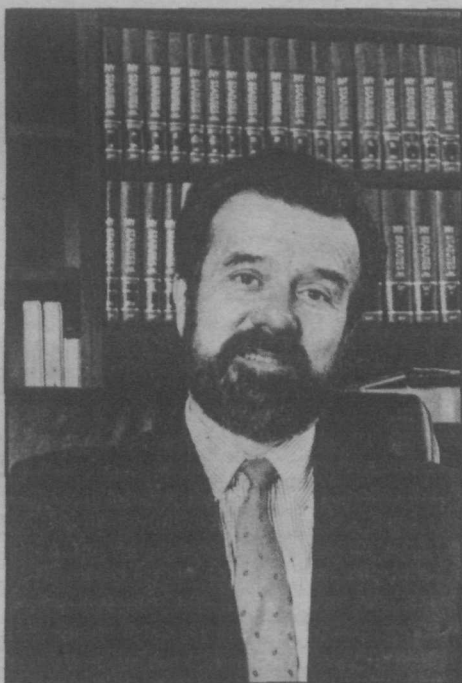
Eischen, 45, explained that membership in the academy is limited to arbitrators who preside over labor-management disputes and are selected "after a strenuous peer review process of their professional qualifications."

Current membership includes 700 arbitrators, most of whom are labor professors or lawyers, in every U.S. state and in Canada; as well as correspondent members who live in other nations and honorary members.

Eischen's election this year to a three-year term in his current post required the academy to move its headquarters. The previous executive secretary, Dallas L. Jones, was based in Ann Arbor with support from the University of Michigan.

"I decided to locate my new headquarters in Ithaca because I have lived here since 1976 while traveling around the nation as a labor arbitrator," Eischen said.

Eischen received a master's degree from



Tim Moersh

Dana Edward Eischen

ILR in 1968 and then earned his law degree at Georgetown University. The academy's office is in Cornell's Business and Technology Park near Tompkins County Airport.

Eischen has arbitrated disputes in various industries including several umpireships involving airline unions and carriers.

—Albert E. Kaff

NOTABLES

The American College of Obstetricians and Gynecologists has selected **Joan Jacobs Brumberg**, associate professor of human development and family studies in the College of Human Ecology, as one of two recipients of its 1990-91 fellowships in the History of Obstetrics and Gynecology. The fellowship carries a \$5,000 award to support a month's residency at the society's archives in Washington, D.C. Brumberg will study the changing social and cultural experience of menarche in the United States for a book she is writing on the history of female adolescence. She is the author of "Fasting Girls: The History of Anorexia Nervosa as a Modern Disease."

The Geological Society of America has awarded **Jack Oliver**, the Irving Porter Church Professor of Engineering, its 1990 George P. Woollard Award in recognition of contributions to geology through the application of geophysics. He was cited for "his major contributions to our knowledge of the Earth's crust through the application of seismic techniques, the establishment of the Worldwide Seismographic Station Network, his key assistance with the acceptance of the fledgling idea of plate tectonics, to his establishment of the COCORP continental seismic reflection profiling program."

BRIEFS

■ **To retire:** An open reception for Fleet Morse, who is retiring Dec. 21 after 40 years in various capacities (currently a waiter) at the Statler Hotel since it opened as the Statler Inn in 1950, is scheduled for Wednesday, Dec. 19, at 3:30 p.m. in the Statler's Carrier Grand Ballroom.

■ **Cornell on TV:** The capital campaign to increase funding for the university's future will be the subject of the next "Cornell Community Report," a half-hour television show on Cable Channel 7, scheduled for 7:30 p.m. Wednesday, Dec. 19, and again at 10:30 p.m. Tuesday, Dec. 25. Also, viewers will see a tour of the College of Veterinary Medicine's Equine Research Park.

■ **Tokyo:** Persons on campus with stored or auto-dial telephone numbers in Tokyo, Japan, should be aware of a massive telephone number change in Tokyo that will go into effect at noon Monday, Dec. 31. An extra digit — a 3 — will be added to all seven-digit numbers in Tokyo. For example, to reach 123-4567 in Tokyo from Cornell now, one dials 9-011-81-3-123-4567. With the change, callers from the United States will have to dial 9-011-81-3-3-123-4567. For more details, contact David Perkins at Cornell Information Technologies, 255-9705.

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Cornell University is committed to assisting those persons with disabilities who have special needs. A brochure describing services for the handicapped student may be obtained by writing to the Office of Equal Opportunity, Cornell University, 234 Day Hall, Ithaca, N.Y. 14853-2801. Other questions or requests for special assistance may be directed to that office.

GRADUATE BULLETIN

January degree: The thesis/dissertation submission deadline for a January 1991 degree is Jan. 11. Students should see the Graduate School thesis adviser (walk-in office hours 8:30 a.m. to noon, 1:30 to 4:30 p.m. weekdays) for approval of the format of their thesis/dissertation before submitting the final copies to the Graduate School. During the week of Jan. 7 through 11, the thesis adviser will see only students trying to meet the Jan. 11 deadline.

Fellowships: Applications for foreign language and area studies fellowships for 1991-92 are available in the graduate field offices and the Fellowship and Financial Aid Office, Sage Graduate Center. The application deadline is Jan. 18.

Javits fellowships: Applications are available for Jacob K. Javits Fellowships for doctoral students in the arts, humanities and social sciences who are U.S. citizens or permanent residents and have fewer than 20 credits. The deadline is early February. The award is renewable.

OBITUARIES

Norman R. Lyons, assistant professor of information systems at the graduate school of management from 1970 to 1976, died Nov. 2 at his home in Pacific Grove, Calif., of amyotrophic-lateral sclerosis (Lou Gehrig's disease). He was 46. He retired from the Naval Postgraduate School in 1988. He received a bachelor's degree from Stanford University in 1966 and a doctorate from Carnegie-Mellon University in 1972. Survivors include his wife, Margaret Marriott, of Pacific Grove, Calif.; two sons, Michael and David, both of Santa Barbara, Calif.; his mother, Ethelyn, of Roswell, Calif.; and two brothers.

Katherine R. Spinney, head librarian of the Hotel School from 1960 until her retirement in 1979, died Nov. 9 at her home in Ithaca after a lingering illness. Born in Nova Scotia, she was a graduate of Delhousie University, Nova Scotia, and earned a graduate degree in library science from McGill University, Montreal.

Engineer seeks 'smartest' distance between two points

From routing trucks carrying hazardous waste through populated areas to planning the most efficient dispatch of railroad freight cars, Cornell civil engineer Mark Turnquist is developing mathematical models that optimize complex tasks.

His models are already saving one railroad a projected \$1 million a month, and the techniques will also prove important in helping to make the politically difficult decisions on transporting tons of nuclear waste to their final resting place.

What's more, his research could aid any organization seeking to optimize transport decisions, including trucking firms, car- and truck-rental companies, shipping lines and electric-power companies.

Turnquist, a professor of civil and environmental engineering, develops mathematical models aimed at finding the best solution to problems involving large-scale networks. Such models consist of sets of interrelated equations that calculate the most efficient solution to a problem, given a series of parameters.

In the case of railroad cars, the problem is quickly moving empty freight cars in a freight network to a terminal where they can be put to work again.

For CSX Transportation Inc., which began using Turnquist's computer model last March, the big problem is the net inflow of freight cars into the system. The railroad line, which operates throughout the eastern United States, continually receives an influx of cars from the West, carrying food, forest products and minerals. If the cars remain on the CSX network, the result is a \$100 million a year payout to other railroads for "car hire."

Using Turnquist's program, which runs on IBM PS/2 personal computers, the car distributors at CSX's Baltimore headquarters feed in data on the location, car type and owner of the thousands of cars in its system.

Each Thursday, the CSX car distributors ask Turnquist's model to generate a dispatch plan for the following week, which consists of a long series of flow orders that are sent to the freight line's mainframe computer. The hierarchical list of orders ranges from specific needs of that week to general needs for reallocation of cars.

Throughout the week, as a freight car is reported empty to the central computer, the computer compares the car and its location to the list and when it discovers a match of car to need, sends a flow order to the individual terminal, which dispatches the car.

"They had the mainframe system in place for about two years, but they were generating flow orders largely by the seat of their pants," said Turnquist. "As the distributors looked for cars on the system, they were like fishermen casting their nets, and there was a lot of overlap and confusion."

According to Turnquist, the railroad is still perfecting the system, but they project savings of about \$1 million per month from increased efficiency. Other railroads, in-

cluding the Union Pacific have expressed interest in his model, and the Burlington Northern has embarked on a similar effort collaborating with engineers from the Massachusetts Institute of Technology, he said.

If routing railroad cars is a relatively straightforward matter of finding the most efficient schedule, routing hazardous waste is emphatically not.

Moving a truckload of chemical waste or spent nuclear fuel from one point to another means far more than simply finding the shortest route. Planners must make trade-offs among a host of other factors, including the number of people potentially exposed; the relative hazards of accidents on different kinds of roads; the proximity of routes to hospitals, schools, water supplies and petroleum refineries; and curfews on shipments at certain times.

And their planning must be part of a political, not just a technical, process.

Turnquist's optimization models for haz-

ardous waste transport aim at revealing to planners as clearly as possible what the alternatives are. His approach is quite different from those previously used, which could consider only one objective at a time. Also, until Turnquist's approach, the principal waste-transport-planning method analyzed routes from a given road network and a set of objectives.

"What we want to do in the end as analysts is not to specify what weight should be given to the many factors," said Turnquist. "We want to put in front of the political process a set of alternatives, none of which may be the absolute best. However, these alternatives will make the trade-offs quite explicit. Then, the political debates about tradeoffs and values can be made with the best possible information."

Working under a contract with Sandia National Laboratories, Turnquist is developing a nuclear-waste routing program that

incorporates such multiple objectives. Given a map of an area, along with objectives and curfew constraints, the program can arrive at a series of solutions, complete with details on the strengths and weaknesses of each route.

The Department of Energy has proposed a high-level-waste repository at Yucca Mountain, Nev., and if the repository becomes operational early in the next century, Turnquist's techniques will aid planners in routing wastes to the site.

"It's an enormous transport problem, because most nuclear reactors are in the East, which means a long transport route," said Turnquist.

To make the program even easier to use, Turnquist is now developing computer-graphics techniques to visualize the routes and tradeoffs, helping planners more easily explore the complex possibilities for moving waste.

—Dennis Meredith

Brushing up



Senior architecture major Andrew Chiappetta prepares to work on his painting project.

Tim Moersch

Federal programs are shifting from basic to applied research

Even as Cornell continues its efforts to meet the demands of society for the fruits of research, the nature of those demands is changing. For example, federal programs are shifting away from the basic research that provides a foundation for future technology and toward more applied research.

"There's a lot of pressure for faculty research to be more relevant to practical problems," said Jack Lowe, associate vice president for research.

The debate is complex and subtle over whether more applied research is good or bad, but the results are obvious to Lowe: more administrative time and costs.

"As a sponsor wants more applied research, the sponsor wants to control the work more, and this makes negotiations for the funds more difficult and time consuming," said Lowe.

Said Michael Whalen, director of financial planning and budget management: "This [greater emphasis on applied research] means that funding for big research depends on what's hot."

The rise in research funding also creates rising expectations among faculty in fields that typically don't receive outside funding, said Whalen. The result is more pressure on the university: "In areas with no strong external support, faculty may look to institutional funds as grantlike sources," he said.

The increasing specialization and interdisciplinary nature of science also means

increasing complexity in funding, as more research centers are created. Thus, Cornell now has some two-dozen research centers, including six national centers, where scholars from many fields gather to concentrate on joint research.

Federal funding for national centers comes in large block grants, rather than as a multitude of small grants. According to Lowe, in 1983 roughly one-third of the university's endowed-college federal research funding came through block grants; in

The economics of research

Last of a five-part series

1989, the figure was 50 percent.

"There's a debate about whether block grants are good or bad," said Lowe. "They're a more efficient way to get research grants, but they increase the vulnerability of the university to cuts. However, many federal programs are moving toward block grants, so the university doesn't necessarily have a choice in the matter."

While the interdisciplinary research fostered by such research centers does offer powerful advantages in allowing new approaches to complex problems, there are also disadvantages. For one thing, such

block grants may exacerbate what many see is a dangerous trend away from individual research.

"[The rise of block grants] submerges the scholarship of individual faculty members even more," Whalen said. "They must merge their research activities with those of the group." However, points out Norman Scott, vice president for research and advanced studies, such problems have been addressed in the structure of many of Cornell's centers, which do act to foster individual research initiative.

"Such centers as the Materials Science Center and the Biotechnology Program really operate a mini-grant program on campus to fund individual research," he said. "Often they will require two faculty from different units to cooperate, to create the necessary synergy," he said. In any case, he said national centers are necessary to provide large-scale facilities to Cornell and the rest of the nation that wouldn't be otherwise available. At Cornell, such centers include the Theory Center, the National Nanofabrication Facility, the Cornell Electron Storage Ring and the National Atmospheric and Ionosphere Facility that operates Arecibo Observatory.

Besides providing Cornell with unmatched research facilities, such large centers also attract industry.

"Industry is more likely to leverage its own research capabilities with those of ma-

jor research universities, shifting more and more of the country's research burden to research institutions," said Clint Sidle, director of institutional planning. "Already, we are developing consortia with industry, where we share the costs and benefits of research, and where their scientists work in concert with our faculty in a team effort."

As to the future of federal funding, Scott sees a possible erosion of faculty quality due to increasingly tighter federal funds.

"Now that the federal commitment to research is waning, more and more faculty are competing for fewer dollars," he said. "There's a real concern that because of this competition, scientists and engineers will go to industry, where they don't have to fight so hard for research dollars."

Even though the short-term outlook is bleak, Sidle sees an inevitable long-term increase in research funding "as government acknowledges the contributions of research institutions in maintaining the nation's competitive edge, especially in contributions to basic research."

Clearly, the country desperately needs Cornell and its fellow leading research universities to help build and maintain its economic and intellectual foundation for the future, say Cornell administrators. In turn, they assert, the government should develop policies to help rebuild and maintain the foundations of its great universities.

—Dennis Meredith

CALENDAR

All items for the Chronicle Calendar should be submitted (typewritten, double spaced) by campus mail, U.S. mail or in person to Joanne Hannan, Chronicle Calendar, Cornell News Service, Village Green, 840 Hanshaw Road.

Notices should be sent to arrive 10 days prior to publication and should include the name and telephone number of a person who can be called if there are questions.

Notices should also include the subheading of the calendar in which the item should appear.

DANCE

Cornell International Folkdancers

All events are open to the Cornell Community and general public. Admission is free, unless stated otherwise. For further information, call 257-3156.

Holiday Party, 6 to midnight, Dec. 16, dinner at 7, auditorium, Biotechnology Building. Bring dish to share. Dancing resumes Jan. 6.

Israeli Folkdancing

Israeli folkdancing, Thursdays, 8:30 p.m., Edwards Room, Anabel Taylor Hall.

EXHIBITS

Johnson Art Museum

The Herbert F. Johnson Museum of Art, on the corner of University and Central avenues, is open Tuesday through Sunday from 10 a.m. to 5 p.m. Admission is free. Telephone: 255-6464.

"Border Crossing: The Photography of Johan van der Keuken," through Dec. 21.

Department of Art Faculty Exhibition, featuring the painting, sculpture, print-making and photography of current and emeritus faculty members of the Art Department, through Dec. 21.

Olin Library

"Cornell University Celebrates 125 Years," an exhibit on display through Dec. 31, weekdays from 8 a.m. to 5 p.m. Archival documents, historical photographs and student memorabilia celebrate the founding and mission of the university.

Uris Library

"The Arab World in Fact and Fiction," a display in the library's nine display cases, through December.

FILMS

Films listed below are sponsored by Cornell Cinema unless otherwise noted and are open to the public. All films are \$3.50 except weekend films (Friday and Saturday), which are \$4.50 (\$4 for students). All films are held in Willard Straight Theatre except where noted.

Thursday, 12/13

"Love Brewed in an African Pot," part of the film series, "Africa in a Time of Change," sponsored by the Institute for African Development; Africana Studies and Research Center; and Cornell African Students Association, 7:30 p.m., Tjaden Hall.

"Mad Max" (1979), directed by George Miller, with Mel Gibson, Joanne Samuel and Hugh Keays-Byrne, 7:30 p.m.

"Young Guns II" (1990), directed by Geoff Murphy, with Emilio Estevez, Kiefer Sutherland and Christian Slater, 9:45 p.m.

Friday, 12/14

"Young Guns II," 7:30 p.m.

"Jesus of Montreal" (1989), directed by Denys Arcand, with Lothaire Bluteau and Remy Girard, 7:15 p.m., Uris.

"A Handmaid's Tale" (1990), directed by Volker Schlöndorff, with Robert Duvall and Faye Dunaway, 10 p.m., Uris.

"Monty Python and the Holy Grail," 10 p.m.

Saturday, 12/15

"A Handmaid's Tale," 7:10 p.m., Uris.

"Harold and Maude" (1972), directed by Hal Ashby, with Ruth Gordon, 7:30 p.m.

"Jesus of Montreal," 9:45 p.m., Uris.

"Young Guns II," 9:45 p.m.

Sunday, 12/16

"Monty Python and the Holy Grail," 8 p.m.

Monday, 12/17

"Paris, Texas" (1984), directed by Wim Wenders, with Harry Dean Stanton, Nastassja Kinski and Dean Stockwell, 8 p.m.

Tuesday, 12/18

"Five Easy Pieces" (1970), directed by Bob Rafelson, with Jack Nicholson, Karen Black and Sally Struthers, 7:15 p.m.

"Wild at Heart" (1990), directed by David Lynch, with Nicholas Cage, Laura Dern and Willem Dafoe, 9:40 p.m.

Wednesday, 12/19

"Pierrot Le Fou" (1965), directed by Jean-Luc Godard, with Jean Paul Belmondo and Anna Karina, 7 p.m.

"Wild at Heart," 9:35 p.m.

Thursday, 12/20

"The Road Warrior" (1982), directed by George Miller, with Mel Gibson, 7:20 p.m.

"Wild at Heart," 9:40 p.m.

MUSIC

Department of Music

A vocal master class given by baritone Sanford Sylvan and the singers chosen from the Dec. 6 audition will be held Dec. 13 at 8:15 p.m. in Barnes Hall.

Bound for Glory

Records from the studio. Bound for Glory can be heard Sundays from 8 to 11 p.m. on WVBR-FM, 93.5.

Henry Coffeehouse

Folksingers Phil Shapiro and Cathy Bargar will present a program of songs in the "new folk tradition" Dec. 14 at 8 p.m. in The Henry, Sage Hall. Admission is free.

RELIGION

Sage Chapel

Robert L. Johnson, director, Cornell United Religious Work, will deliver the sermon Dec. 16. Service begins at 11 a.m. Music will be provided by the Sage Chapel choir under the direction of Donald R.M. Paterson. Sage is a non-sectarian chapel that fosters dialogue among the major faith traditions.

Baha'i

Weekly meetings on campus. Call 257-7971 for information.

Catholic

Masses: Saturdays, 5 p.m., Sundays, 9:30 a.m., 11 a.m., 5 p.m., Anabel Taylor Auditorium. Daily masses, Monday through Friday, 12:20 p.m., Anabel Taylor Chapel.

Christian Science

Testimony meetings, Thursdays, 7 p.m., Founders Room, Anabel Taylor Hall.

Episcopal (Anglican)

Sundays, worship and Eucharist, 9:30 a.m., Rev. Gurdon Brewster, chaplain, Anabel Taylor Chapel.

Friends (Quakers)

Sundays, 10 a.m., adult discussion; 11 a.m. meeting for worship, Edwards Room, Anabel Taylor Hall.

Jewish

Morning Minyan at Young Israel, 106 West Ave. Call 272-5810.



Daniel (Lothaire Bluteau) in Denys Arcand's funny and thought-provoking film, "Jesus of Montreal," playing Friday and Saturday nights in Uris Auditorium. See the Films listing for times.

Shabbat Services: Friday: Conservative/Egalitarian, 5:30 p.m., Founders Room, Anabel Taylor Hall; Reform, 5:30 p.m., Anabel Taylor Chapel; Orthodox, Young Israel (call 272-5810 for time). Saturday: Orthodox, 9:15 a.m., One World Room, Anabel Taylor Hall; Conservative/Egalitarian, 9:45 a.m., Founders Room.

Korean Church

Sundays, 1 p.m., Anabel Taylor Chapel.

Muslim

Fridays, 1 p.m., Anabel Taylor Edwards Room.

Protestant Cooperative Ministry

Sunday worship, 11 a.m., Anabel Taylor Chapel; Taize Prayer, Tuesdays, 5:30 p.m., Anabel Taylor Chapel; Bible study, Thursdays, noon, G-7 Anabel Taylor; Celebration, Fridays, 5 to 8 p.m., 401 Thurston Ave. Call the Rev. Barbara Heck, chaplain, 255-4224, for information.

Seventh-Day Adventist

Student association, Fridays, 7:15 p.m., 314 Anabel Taylor Hall.

Zen Buddhism

Zazen practice Tuesdays 6:45 p.m. and Thursdays 4:30 p.m. in Anabel Taylor Chapel. For more information or to arrange beginner's instruction, call Jon Warland at 272-0235.

SEMINARS

Biochemistry

"Aspects of Lipoyxygenase Chemistry," Max Funk, University of Toledo, Dec. 14, 4 p.m., Large Conference Room, Biotechnology Building.

Geological Sciences

"Oil, Geology, Politics and Geophysics of the Middle East," Muawia Barazangi, geological sciences and Institute for the Study of the Continents, Dec. 18, 4:30 p.m., 1120 Snee Hall.

Microbiology

"Rapid Site-Specific DNA Inversion in Es-

cherichia coli Mutants Lacking the Histone-Like Protein H-NS," Tom Kawula, microbiology, Dec. 13, 4 p.m., Large Conference Room, Biotechnology Building.

Pharmacology

"Role of Protein-Tyrosine Kinases in Cell Growth and Transformation," Lyuba Varticovski, St. Elizabeth's Hospital, Boston, Dec. 20, noon, Pharmacology Library, D101M Schurman Hall.

SPORTS

Home games only

Saturday, 12/15

Men's JV Basketball, Hargrave Military Academy, 3:30 p.m.

Men's Basketball, Binghamton, 7:30 p.m.

MISC.

Cornell Ju-Jitsu Kai

Kodenkan, Dan Zan Ryu Ju-Jitsu: the practice of self-protection with or without weapons will be held Tuesdays and Thursdays, 7 to 9 p.m., and Saturdays, 12:30 to 3 p.m., in the wrestling room, Teagle Hall. For information, call Roy at 255-2088.

CUSLAR

The Committee on U.S.-Latin American Relations will discuss recent events in Latin America, Mondays, 5:15 p.m., Commons Coffeehouse, Anabel Taylor Hall. For more information, call 255-7293.

Narcotics Anonymous

Meetings for recovering addicts to help each other stay free from drugs are held Tuesdays at 6 p.m. in G-18 Anabel Taylor Hall.

Tae Kwon Do

Self-defense open to beginners of all ages. Women are strongly encouraged. Classes will be held Sundays, 7 to 8 p.m.; Monday through Thursday, 6 to 7 p.m. For more information, call Sandy at 255-7923 or 272-5766.

Insects and their scholars are vanishing species

A Cornell entomologist has recommended an emergency, worldwide effort to collect between 1.5 million and 50 million new insect species before they become extinct, even though not enough specialists currently exist to explore the insects' evolutionary significance.

"Insects can and should be collected and preserved at a rate far in excess of that at which they can be studied," Quentin D. Wheeler, professor and chairman of the Department of Entomology, advocates in the November 1990 issue of the journal, *Annals of the Entomological Society of America* (ESA). His article, "Insect Diversity and Cladistic Constraints," calls for training many more scholars in his vanishing

specialty (systematics, taxonomy and cladistics) to explain the pattern of evolutionary history that could be hidden in "entomological morgues" of the future.

The task facing specialists in cladistic analysis is like assembling an enormous jigsaw puzzle with each piece representing one insect species, Wheeler said. (Cladistics, he explained, is the science that determines the degree of relatedness of species.) Because of deforestation and species extinction, he said, "pieces of the puzzle are being destroyed faster than they can be collected and put in a box for future contemplation."

"The singular position of each piece in the puzzle can be determined long after the

species is extinct if representative specimens have been preserved in museum and tissue collections," Wheeler writes in the journal article. "We have the opportunity to collect and preserve many pieces of this evolutionary puzzle that are otherwise certain to be irretrievably lost to science."

Large-scale collection and cladistic analysis would not detract from the interests of conservation biology, Wheeler said. "To the contrary, progress in inventory and phylogenetic knowledge will assist the conservation effort, by knowing what species exist and by being able to make priority decisions in light of some measure of phylogenetic diversity."

Cladistic analysis helps advance understanding of evolution, one of the major foundations of modern biology, but it can also have real-world applications, Wheeler says.

For example, knowing how insect species are related can help in choosing parasites to control insect pests, the entomologist says and points to parasitic wasps. "As their phylogeny is gradually learned, entomologists will be able to predict biological-control applications and probable host acceptability."

At approximately 751,000 species, there are already more kinds of insects known to science than any other form of animal or plant. That fact is illustrated by the "speciescape" that accompanies Wheeler's journal article. In the speciescape by Frances Fawcett, a Cornell scientific illustrator, the size of individual organisms represents the number of described species. Thus, a huge beetle (*Agathidium oniscoides*) that represents the insect species named to date overwhelms less diverse forms, including multicellular plants at 248,428 species, other arthropods at 123,161, and mammals, about 4,000 of us.

Many more species of insects remain to be discovered and described — but not for long, Wheeler warns. The leafy canopy of the tropical forests may contain tens of millions of undescribed insect species, Wheeler says, citing estimates of T.L. Erwin. A Smithsonian entomologist, Erwin sprays insecticidal fogs into tropical forest canopies and counts the new insects that fall to the ground; in one Peruvian forest section that is half the size of a football field Erwin found more than 4,000 species of beetle, including many that were unknown to science.

That same kind of rain forest is now being cleared at the rate of a football field a second, Wheeler notes, crediting reports by the National Science Board and the United Nations Food and Agricultural Organization. Assuming that there are 10 million

species of insects and that 50 percent will become extinct in the next 30 years, the Cornell entomologist calculates, there will be an average of nearly 19 insect species lost per hour.

"As dismal as current rates of deforestation are, the rate is likely to increase rather than remain constant," Wheeler writes in the entomological society journal. "There is no question that little undisturbed forest will survive into the second quarter of the 21st century. The pressing questions instead are 'What will we do?' and 'How quickly will we do it?'"

Thus, Wheeler advocates an immediate beginning to a massive insect-collection and specialist-training program. He recommends training at two levels: professional collectors and collections managers with master of science degrees, and taxonomists with Ph.D. degrees. Collections specialists can receive on-the-job training while they are students in collaborative programs between universities and museums, Wheeler suggests, offering two existing examples, the American Museum of Natural History and Cornell and the Smithsonian Institution and the University of Maryland.

Inventorying 10 million newly discovered species would take the lifetime efforts of 25,000 taxonomists, Wheeler says, citing an estimate by Harvard entomologist E.O. Wilson.

Training Ph.D. students with specializations in systematics — the study of species and their relationships — would require \$1.87 billion. That is a lot of money to universities but not to the federal government; the specialists in insect systematics could be trained for 0.375 percent of the amount to be spent for the savings-and-loan bailout, Wheeler observes.

At the same time, the number of students entering the field is declining, and systematic entomologists could become an endangered species, Wheeler warns, citing recent surveys: Between 1979 and 1989 the number of graduate students pursuing degrees in systematic biology (including entomology) in the United States declined from more than 3,000 to fewer than 1,200. The number of Ph.D.s awarded in all areas of entomology averaged 170 per year in the 1970s but had dropped to 133 a year in 1988.

Time is running out for the training effort, emphasizes Wheeler. Even if universities stepped up their training of Ph.D. entomologists to five times the current rate, it would take more than 37 years to train 25,000 recruits. A million insect species would become extinct in each five- to six-year period it takes to train a Ph.D. entomologist.

— Roger Segelken



Professor Quentin Wheeler (right) and scientific illustrator Frances Fawcett look over a "speciescape" in which the size of each species represents its total number worldwide.

Viral nucleic acid makes plants immune to disease

By inserting a specific nucleic acid from a disease-causing virus into tobacco plants, scientists at Cornell's Biotechnology Institute have found, in a serendipitous discovery, that they can make the plants completely immune to that disease.

Far more important than the achievement with tobacco plants, say the scientists, is the probability that they can do the same for other plants and perhaps animals.

The Cornell biotechnologists aren't sure why a gene sequence called 54-kDa from the tobacco-mosaic virus makes tobacco plants resistant. They have filed for patents on the virus-control process.

"This gene sequence gives absolute immunity to the tobacco mosaic virus, even when the plant is exposed to very high concentrations of virus," said Milton Zaitlin, a Cornell professor of plant pathology and director of the Cornell Biotechnology Program. "Once the plants are transformed with the 54-kDa gene sequence, it becomes part of the plant's genetic material, and the virus will not replicate."

Zaitlin credited George P. Lomonosoff, a visiting scientist from the John Innes Institute in Norwich, England, with cloning the 54-kDa gene sequence and Daniel B. Golemboski, a postdoctoral associate in the Cornell Department of Plant Pathology, with transforming the plants.

The Biotechnology Program and Cornell are negotiating licensing agreements with several companies, Zaitlin reported. The same laboratory is now seeking similar genetic regions, called motifs, in viruses that affect economically important crop plants, including the cucumber mosaic virus and the pea early browning virus. The motif is believed to be characteristic of enzymes that are used by viruses to replicate themselves.

Long strings, or sequences, of nucleic acids — deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) — hold the genetic blueprints of the cell. Many viruses use RNA as their genetic material. DNA or RNA strings make up genes that provide the instructions for the living cell to produce proteins that constitute the cell's structure and biological machinery. For example, some genes are blueprints for protein enzymes that are the chemical workhorses of the

cell, catalyzing the chemical reactions that operate the cell. When a virus infects a plant or animal, it inserts its genetic material into the infected organism, tricking the cell's machinery into reproducing its own genes.

The Cornell scientists performed their initial work on the tobacco-mosaic virus (TMV), an RNA virus, because it is one of the most-studied plant viruses, and scientists have mapped much of its genetic structure. Thus, the Cornell group and other plant pathologists already knew the location and function of several TMV gene sequences.

Analyzing proteins produced when a TMV infects tobacco plants, the Cornell scientists found that one such TMV gene sequence seemed to code for a protein — 54-kDa protein — that never showed up in the infected plants.

The machinery for producing the 54-kDa protein was at least partially intact. For example, the messenger RNA, a carrier molecule that transfers information from genes to the protein-making machinery, did exist for the protein. However, for reasons not yet established, the researchers were unable to isolate the protein from infected cells.

More out of scientific curiosity than pursuit of disease-fighting strategies, Zaitlin's research group decided to "force" the mysterious 54-kDa gene into tobacco plant genes to see what would happen. They first made huge numbers of copies of the 54-kDa gene — a process called cloning. Then they spliced the cloned gene into the genes of a bacteria (*Agrobacterium*) that could be used to carry the gene into the tobacco plant and insert it into the plant's genes. Then, the scientists attempted to infect the treated tobacco plants with TMV.

"To our great surprise, the plants were completely resistant to the virus," Zaitlin said. "Something is blocking replication, early in the process. The mechanism of resistance is now under investigation."

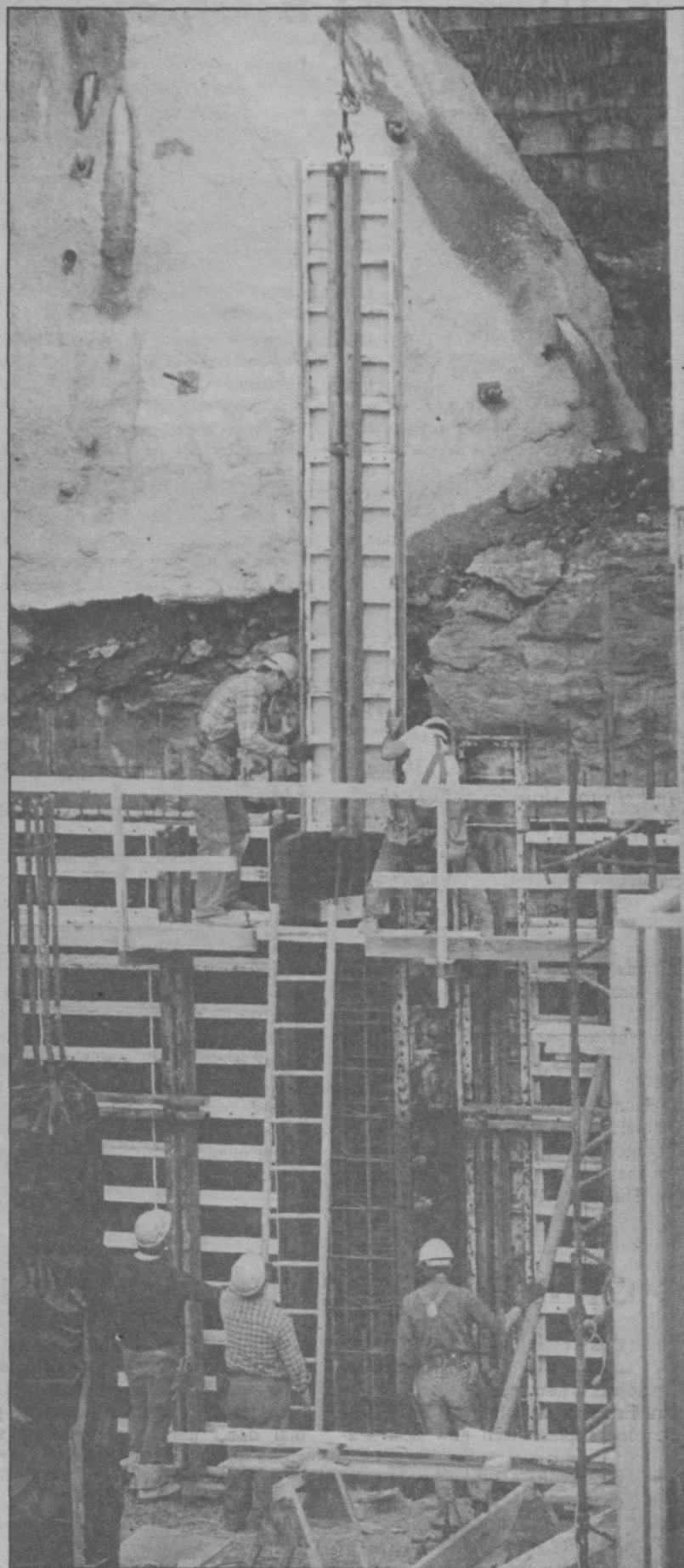
Subsequent generations of tobacco plants, each carrying the 54-kDa sequence in the plant's DNA, also proved resistant when they were inoculated with high concentrations of TMV RNA and with related strains of TMV, the Cornell scientists reported.

— Roger Segelken



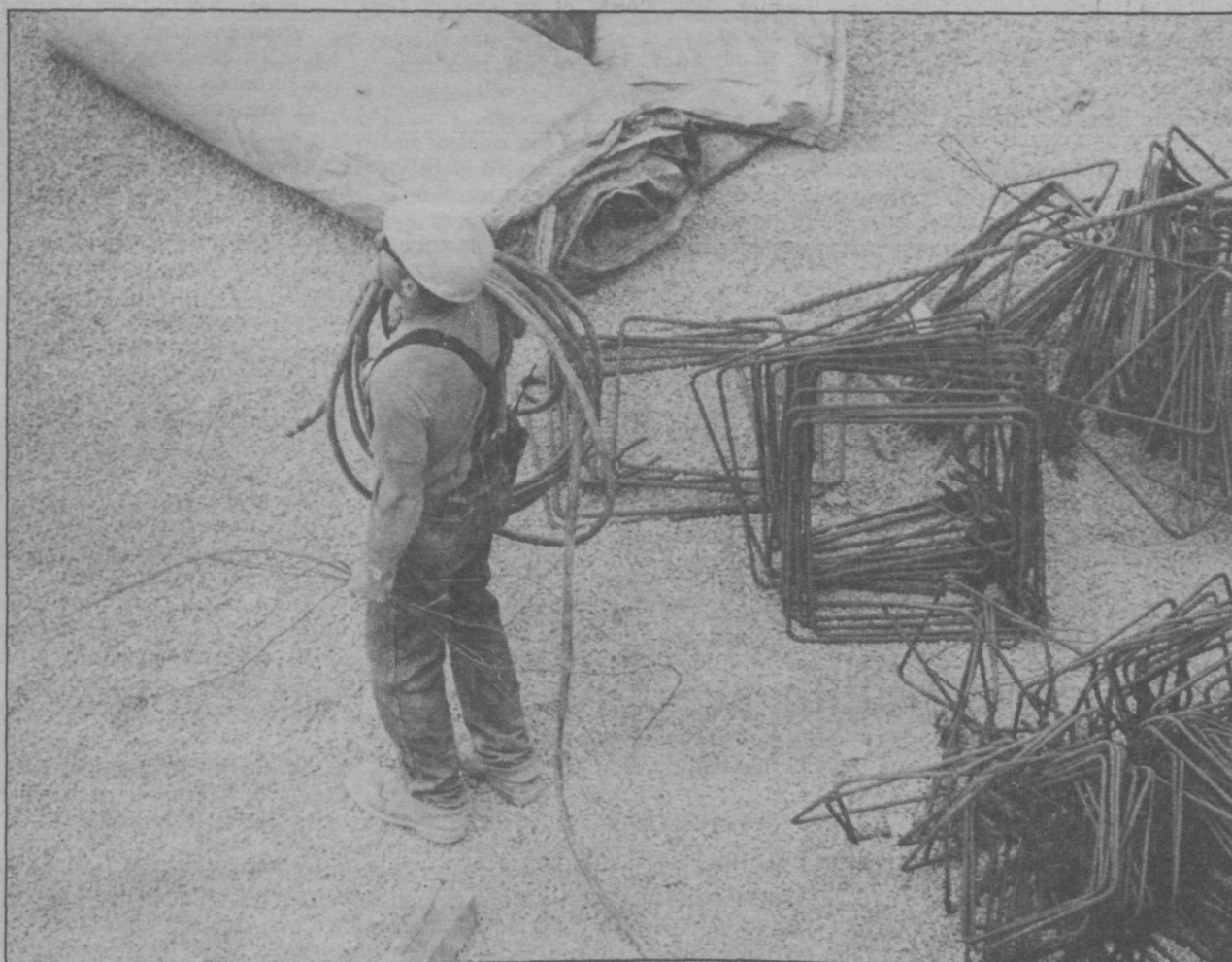
Tim Moers Dan Golemboski (left), a postdoctoral associate in plant pathology, and Professor Milton Zaitlin, director of the Biotechnology Program, examine tobacco plants similar to those used in their virus tests. They found that by injecting a nucleic acid, they can make the plants immune to a disease.

Men at work



Work on the 90,000-square-foot extension of Olin Library is well under way and is only a few weeks behind construction schedule. Construction still is expected to be completed on time, in March or April of 1992. The \$25.5 million addition is expected to open in September 1992. The addition will house Cornell's extensive research and special collections.

Photographs by
David Lynch-Benjamin



Engineering student is an environmental detective

Last winter, senior Julie Curulla found herself far from the academic round of laboratories and classes she was used to, when she took on a work assignment in Cornell's Engineering Cooperative Program.

Instead of handing in problem sets and puzzling over exam questions, the student in civil and environmental engineering found herself snooping around a Dallas restaurant, looking for possible environmental problems.

Hired by the consulting firm McLaren/Hart of Cherry Hill, N.J., she was assigned to perform what's known as a Preliminary Phase I Environmental Assessment for a bank that was to finance purchase of the property. Participants in the Cooperative Program are hired by corporations for two work periods, a September-to-January stint during their junior year and a summer work period before their senior year. Cornell's program is unusual in that the students graduate in the usual four years by taking

be a thorough one.

"I checked the site for PCBs, asbestos or underground storage tanks," she recalled. "I monitored how chemicals were stored on and around the property and searched within a one-mile radius for other sites that could harm our site. I also did a background search to see whether the site had ever had a previous use that might be of environmental concern, such as a landfill." Curulla was more than a field operative on the project, however.

"Although I was a junior auditor, I prepared the proposal, did the project budget, went to Dallas and did the audit, wrote the report and communicated it to the client," she said.

Besides her work in Dallas, Curulla developed plans for an audit program for a pipeline company, visited a landfill site and helped supervise drilling of monitoring wells to detect groundwater pollution.

As with many co-op students, Curulla's experience did more than prepare her professionally for a career; it helped her understand the human side of work.

"I had a really good perspective when I got back to school," she said. "A lot of people [in the workaday world] don't seem to have the same commitment as at school. If you wanted things done right, or the way you thought they had to be done, you had to do them."

The experience has convinced Curulla that even though she's not sure exactly the route she'll take after graduating, environmental work is where the action is for her. She plans to pursue jobs in environmental and geotechnical engineering.

Curulla, a native of Syracuse, is also applying her engineering expertise to public service work. In addition to being an Engineering Ambassador — acting as a host for freshman students and other groups — she is also a coordinator for a unusual project of the student American Society for Civil Engineers group at Cornell. The students are working with a local architect to build a playground structure at the Southside Community Center.

— Dennis Meredith



Julie Curulla

Tim Moersh

'I had a really good perspective when I got back to school. A lot of people [in the workaday world] don't seem to have the same commitment as at school. If you wanted things done right, or the way you thought they had to be done, you had to do them.'

— Julie Curulla

an additional summer of course work after their sophomore year.

"Banks frequently require buyers to have an environmental assessment for a property before they will finance it," she explained. "This is because if the bank does finance a property that has a large environmental liability, the bank, as the lender or mortgage holder, could be held responsible for the cleanup, which could be quite costly." Thus, Curulla's assessment had to

Co-op effort provides students with eye-opening experiences

Kevin Schwartz is helping NASA develop a "smart wing" that automatically bends to adjust to stresses.

Debra Emmons is helping Hughes Aircraft develop sophisticated new heat sensors.

Lily Chu is helping Merck Pharmaceuticals iron out details of a new drug synthesis process.

And Scott Lee is helping Sandia Laboratories build a prototype measurement system used in subjecting electronic components to harsh environments.

All four are junior engineering majors here. This fall, they and their fellow students in the Engineering Cooperative Program encountered the excitement and frustra-

tions of the real world of work.

The students are adjusting to finding their way around huge corporate research complexes, tackling engineering problems that don't have neat textbook solutions, going through the red tape of security clearances and coping with political realities of supervisors, colleagues and work groups.

The experience is eye-opening, say many co-op students:

"The most useful skills I learned as a co-op student were how to better work with other people and how to manage and push through my own personal projects," said senior Jason Voight of his stint at Dow Corning.

Said Dean Chung, who worked at

Merck, Sharp & Dohme: "My co-op experience has made a major impact in how it has enhanced my problem-solving skills. Problems encountered in industry generally demand the synthesis of knowledge from many areas . . . [and] solving a problem is not the only issue of concern — preventing a problem from happening is equally important."

"The co-op program is not just an experience in work; it's an experience in life," said Bingham Cady, the College of Engineering's associate dean for college affairs and professor of nuclear science and engineering. "For instance, it's the first time the student has made a professional contract, the first time he or she has been introduced to professional ethics and obligations. The program invariably turns out to be an unbelievably interesting growth experience for students."

"We've found that co-op students bring back to the classroom a more enthusiastic and enlightened point of view that ends up allowing them to get a better education. They see that writing a computer program or doing a lab experiment can actually mean something in the real world."

The co-op process begins in an engineering student's sophomore year. Those in the upper half of their class may sign up for a co-op experience that commits them to a five-month work session beginning the following September, plus a summer before their senior year.

The Cornell program is unusual in that this work commitment does not prevent their graduation in four years. Co-op students keep up with their classmates by taking a summer schedule of first-semester junior courses immediately following their sophomore year, just before their work session.

For the new crop of co-op students, the process includes 10 to 15 interviews with interested companies, after which they receive offers for their work assignments from those interested. The students will accept the one that most suits their needs for a work experience that will give them a taste of the career path in which they're interested.

But the co-op program doesn't abandon

its young charges after they've taken on a work assignment. A basic handbook on the co-op program has guided the candidates through the acceptance point. Then, the program's breezy "Co-op's Survival Guide," the brainchild of program coordinator Linda Van Ness, takes over. The guide helps the student through the work assignment and beyond, with tips on everything from office politics to finding an apartment to making an omelet.

The Cornell co-op program is still "young" even at 42, say Cady and Van Ness, because it continues to offer a valuable way for universities and corporations to meet some of their critical challenges.

"Corporations look at co-ops as very cost-effective recruiting," said Van Ness. "They get a close look at some of the best

'We've found that co-op students bring back to the classroom a more enthusiastic and enlightened point of view that ends up allowing them to get a better education.'

— Bingham Cady

engineering talent in realistic work situations. It's a much more reliable indicator than the usual one-day plant-recruiting method."

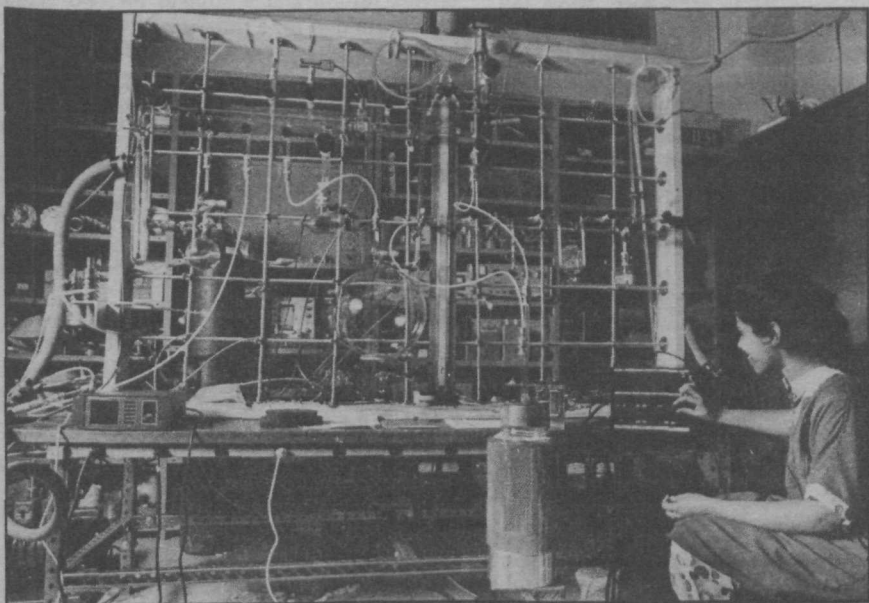
Co-ops can also play a key role in university strategies to attract women and minorities to engineering and keep them.

"A major reason women drop out of engineering is a lack of confidence, and participation in a co-op program can give them incredible self-confidence and reduce the fear that they won't be able to do the job," Van Ness said. This year, 30 percent of co-op students are women.

This year's round of corporate interviews will begin in February, but Van Ness says interested students can still join the program by contacting the co-op office in 105 Hollister Hall.

— Dennis Meredith

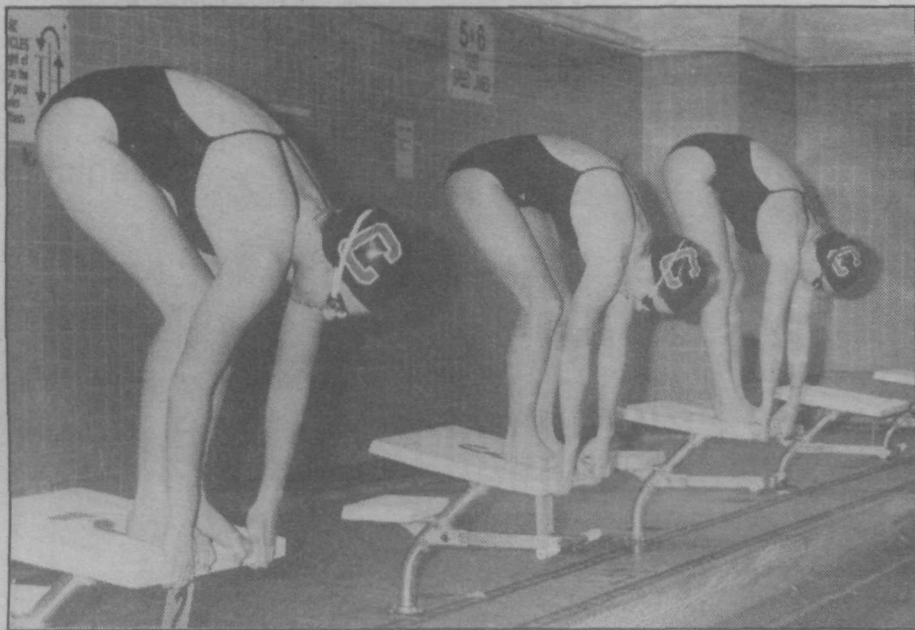
Sun simulator



Tim Moersh

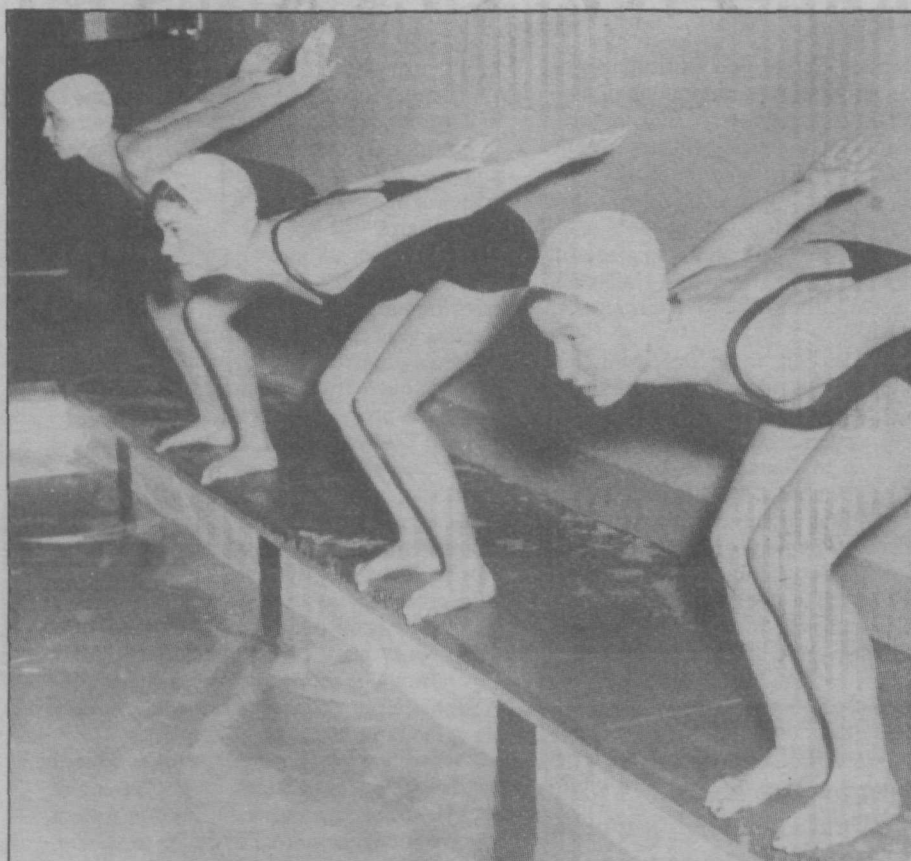
Archita Patnaik, a research associate for Professor Carl Sagan, feeds energy into an apparatus that simulates how the sun bombards objects in outer space. The scientists are learning how organic matter might be formed on the space snowballs called comets. Over the eons, immense amounts of such material reached Earth, aiding the evolution of life.

Double take



David Lynch-Benjamin

Diving toward their 1955 counterparts are senior swimmers (from left) Susan Skoglund, College of Engineering; Kathy Dean, College of Agriculture and Life Sciences; and Deanna Conoscenti, School of Hotel Administration. The women's swim team has a 1-5 record; their next home meet is Jan. 7 against Canisus in Alberding Field House.



1955 Cornellian

Pressures *continued from page 1*

properties at high pressures are experimentally and theoretically well known. Thus, these metals could act as a means of measuring the pressure. The sample volumes were about 40 trillionths of a cubic centimeter, approximately the volume of a drop-let of fine aerosol mist.

After the diamond anvil cell was brought to the maximum pressure, the scientists studied the structure of the sample by subjecting it to the intense X-ray beam from the Cornell High Energy Synchrotron Source (CHESS). The CHESS beam is produced as a byproduct of Cornell's high-energy particle accelerator, the Cornell Electron Storage Ring, operating at more than 5 billion electron volts. The resulting synchrotron beam has roughly the intensity of 1 million medical chest X-rays.

To perform X-ray studies of the tiny chamber, Ruoff and his colleagues constructed a special collimator to narrow the CHESS beam down to four micrometers in width.

By analyzing the diffraction of the X-rays by the sample of known material under pressure, the scientists could calculate the pressure being put on the sample. Besides X-ray studies, the scientists also use high-powered lasers to determine the optical properties of materials under pressure.

X-ray diffraction techniques are the most dependable for measuring the highest pressures reached in diamond anvil cells, emphasized Ruoff.

For example, two other research groups claimed in 1986 to have achieved pressures above the current 4.16-megabar Cornell mark, based on a pressure measurement technique that depended on the fluorescence under pressure of samples of ruby in the diamond anvil chamber.

However, said Ruoff, these reports are not considered valid, because of the unreliability of ruby fluorescence as a pressure-measurement technique. At pressures above about 2.0 megabars, ruby fluorescence is rendered inappropriate for pressure measurements by such possible complicating factors as fluorescence of the diamonds, structural changes in the ruby or changes in the fluorescence spectrum of the ruby. To be valid, ruby fluorescence must be calibrated over the entire pressure range for which it is to be used, said Ruoff.

The groups reporting the high pressures based on ruby fluorescence measurements

were Willie Moss and his colleagues at Lawrence Livermore Laboratory, who reported achieving 4.6-megabar pressures, and David Mao and his colleagues at the Carnegie Institution of Washington, who reported achieving 5.5 megabars. In both cases, said Ruoff, the groups used ruby beyond pressures where it had been calibrated, which was only to 1.8 megabars.

Extremely small diamond tips are required for diamond anvils to achieve ultrahigh pressures, said Ruoff, and the relatively large size of the diamond tips used in the 1986 experiments makes their claims extremely unlikely.

The highest static pressure previously reported, based on X-ray diffraction measurements, was 3 megabars in 1989 by Mao and Russell Hemley.

The Cornell researchers plan to use the improved diamond anvil cell for numerous basic studies of crystal structure. For example, they plan to attempt to create for the first time a particular "phase transformation" theorized to occur in molybdenum at multimegabar pressures, in which the metal changes crystal structure, from "body-centered cubic" to "hexagonal closest packed."

The scientists also plan to explore whether diamond will become a metal at ultrahigh pressures. They have already gathered data indicating that diamond is altering its structure as pressures rise above about 2.5 megabars.

Using the improved diamond anvil, the Cornell scientists will also attempt to squeeze hydrogen and nitrogen enough to cause them to become metals and to confirm that metallization by measuring the samples' electrical conductivity. These studies would extend earlier research on oxygen by Cornell graduate student Serge Desgreniers and Ruoff, in which they found that the reflectivity of oxygen at high pressures resembles that of silver and indicates metallization.

The researchers plan studies of numerous materials important in the electronics industry, including germanium, silicon, gallium arsenide and gallium antimonide.

The Cornell work is supported by the U.S. Department of Energy, as well as the National Science Foundation through the Cornell Materials Science Center. CHESS is also supported by the National Science Foundation.

—Dennis Meredith

Rhodes scholar *continued from page 1*

16,000 people some 65 miles south of Eugene. His family grows peaches, pears, apples, nectarines and hay.

During the haying season, Sand, his brother and father cut and baled 1,000 acres of grass. As soon as school was out in the afternoon, Sand would drive to the haying fields and start work. Working on weekends was a given. And when school let out in the spring they would begin working all day, every day of the week.

It was life and work on the farm that Sand wrote about when applying for a Rhodes scholarship.

"The farm was a place of learning about life and growing," he said. "My father taught me lessons on the farm: about the value of hard work, and that there are no rewards for people who don't work, that if you're not willing to work hard you're not going to reap any rewards and probably shouldn't. Also to help your neighbors and always give someone a hand."

A few very generous hands were extended to Sand, allowing him to transfer to Cornell. The owner of a sawmill where he worked during the summers while in college asked if he was being sufficiently challenged at Oregon State. Sand said he wasn't. The owner offered him the financial resources to go anywhere he liked, as long as he returned to the mill in summertime.

At the same time, the chairman of the Animal Science Department at Oregon State called his old friend from graduate school, Dale Bauman, a Cornell professor of animal science, to ask if Sand could work with his research group studying bovine growth hormone.

Sand at first found himself weighing and measuring samples of beef cow feces but later was given more interesting work.

"Cornell has given me the ability to read research and figure out what it means. And working with Dale Bauman on the bovine somatotropin issue has taught me about how the government uses information," Sand said of the controversial use of growth hormones for raising cattle.

"Most policy-makers don't use all the scientific data available to them or if they do, they don't always base their decisions on it. They make decision based on politics and emotion rather than scientific criteria. Working with the group gave me the ability to understand research science."

Laboratory work also reinforced Sand's belief in the value of people working together "because you're not going to accomplish anything if you don't."

His long-term goal is to work in public policy in agriculture and science. If he enters the political arena, he will do it in or from the state of Oregon. "That's still my true passion," he said. "I owe so much to the people I've worked with in the community and in the sawmills, especially the mill owner, a fantastic man."

Bauman described Sand as "a very capable young man who very clearly has excellent leadership abilities."

In addition to his studies, Sand rows for Cornell's varsity lightweight crew and is a member of Alpha Gamma Rho fraternity.

He is also uncharacteristically modest. He returned from the Rhodes scholarship's regional interviews in Seattle saying all 14 finalists were high-powered and well qualified, tops in their classes and athletics and that any of the 10 who were not chosen could easily have been picked instead of him.

For a long time, he added, "I had heard about the Rhodes fellowship but never dreamed I would be the sort of person who would get it."

Sand is the first person in his family to attend college.

He is the 20th Cornell undergraduate to receive a Rhodes scholarship since they were established in 1902 in the will of 19th-century British industrialist Cecil Rhodes, for whom Rhodesia, now Zimbabwe, was named.

Students are selected on the basis of intellectual achievements, leadership capabilities and physical vigor. The scholarship covers tuition and a stipend for two years with an option for a third year.

—Carole Stone

Professors' son named scholar

Also among the 32 students nationwide selected for the Rhodes scholarship this year was Lawrence Berger, a student at Yale University and the son of Cornell professors Toby and Florence Berger.

Toby Berger is the J. Preston Levis Professor of Engineering and Florence Berger is an associate professor in hotel administration.

Their son, a 1986 graduate of Ithaca High School, plans to study how to make literature exciting to teen-agers while at Oxford. He has co-written a book on the Scholastic Aptitude Test and a cookbook for college students.

Assemblies *continued from page 1*

tee on Transportation Services, suggested that ideas be mailed to the assemblies office at 165 Day Hall.

The plan, besides giving free bus passes, proposes cash payments of \$200 for anyone who walks or bikes to work or who turns in a parking permit to join a car pool.

William E. Wendt, director of Transportation Services, says more than 700 employees have already accepted the bus

passes.

While respecting the parameters Morley has mentioned, the assembly leaders' letter invites comments on such questions as whether cash incentives should be extended even to people living near campus, whether the proposed new parking fees — \$200 a year at perimeter lots; \$400 in center campus — should be keyed to salary, whether maximums are too high altogether and other

details of interest to employees.

Wendt also was scheduled to discuss the details of the program at the regular meeting of the Faculty Council of Representatives Dec. 12 and will set up discussion meetings, upon request, later in the winter.

Copies of the assembly chairmen's letter may be obtained at the assemblies office or by calling 255-3715.

—Sam Segal

CORNELL EMPLOYMENT NEWS

December 13, 1990

Including Job Opportunities

Volume 2, Number 50



Office of Human Resources Encourages Endowed Employees to Consider Select Benefits Program

"IT'S NOT TOO LATE to choose to enroll in the Select Benefits program," says Jean Samuelson, manager of Employee Benefits. "Because of the recent formation of the emergency grant/loan fund, the deadline for signing up for the Select Benefits program has been extended through December 31, 1990," she adds. IRS regulations governing medical reimbursement accounts such as the Select Benefits program stipulate that any eligible employee who wants to participate in the Select Benefits program for an upcoming calendar year must be enrolled before the first day of that year.

To make sure that all endowed employees enrolled in the 80/20 Health Plan are aware of the advantages of participating in the Select Benefits program—including eligibility for the new emergency grant/loan fund—Lee Snyder, director of the Office of Human Resources, is mailing a special letter to all endowed health plan participants this week, strongly encouraging employees who would like further clarification on the provisions of the 80/20 Health Plan, the Select Benefits program, and the emergency grant/loan fund to call the Benefits Office at 255-7508 to set up individual and group counselling sessions.

Accompanying his letter is a brief overview of the emergency grant/loan fund. "The Emergency Grant/Loan Fund was developed to assist employees in the 80/20 Endowed Health Plan who may undergo financial hardship because of unanticipated medical care costs for themselves, or, if they are enrolled in the family plan, for those covered family members," the overview states. "A task force, comprised of active full-time employees and faculty of Cornell University, will establish and review the criteria for hardship and will also make recommendations to the grant/loan fund administrator regarding approval or denial of applications."

The overview also outlines the general eligibility criteria an individual needs to meet to apply for the fund:

- "An individual in the 80/20 Endowed Health Plan must be enrolled in the Select Benefits program or other medical reimbursement or medical savings account to be eligible to apply for the fund."
- "Each individual must file an application and it will be considered separately and anonymously. Each individual applicant's needs and circumstances will be carefully and individually reviewed by the task force established for this purpose."

A notice is also going out to all endowed employees on the same issue through the payroll distribution procedure to ensure that everyone is made aware of the Select Benefits program and the grant/loan fund.

In its initial year, the emergency grant/loan fund will be loosely tied to the Select Benefits program: i.e., because of the recent establishment of the fund and the close timing of IRS requirements, employees will be eligible for the emergency loan fund as long as they are participating in the Select Benefits or another medical reimbursement program, or have established a medical savings account. During this period, enrollment in the Select Benefits program will be one of the criteria weighed in determining who will be a recipient of emergency medical funding, but the task force will determine eligibility and need on an individual basis. In any subsequent years, participation in the Select Benefits program will in all likelihood be a requirement for eligibility for applying for the emergency medical grant or loan.

Basically, opening a medical care reimbursement account in the Select Benefits Program allows employees to pay their (and their covered families') share of eligible medical, dental, and vision expenses with pre-tax dollars. By committing a certain amount of each paycheck (\$5.00 per paycheck minimum), to the medical care account, an employee sets aside funds for future medical expenses. If an employee

opens a Select Benefits medical reimbursement account, that employee can draw funds to pay medical expenses from that account until the amount drawn is equal to the total cumulative sum that that employee will deposit in the account by the end of the year. (i.e., an employee can draw, at any time during the year, an amount equal to what was committed to the account over the course of the year, even if that amount has not yet been accumulated in the account.)

The kinds of expenses that are eligible under this program are varied. They are detailed in the IRS publication 502, *Medical and Dental Expenses*, which is available upon request through Employee Benefits. These covered expenses include, but are not limited to, things such as: capital expenses that accommodate a personal residence to a handicapped condition (entrance ramps, widened doorways, etc.); contact lenses, eyeglasses, and eye examinations; dental treatment; doctors' fees; psychiatric care and psychoanalysis; health plan contributions; hearing aids; hospital services; laboratory and x-ray fees; prescription medicines; transplants; wheelchair costs. Employees are urged to contact the Benefits Office for further information.

When projecting the amount to commit to a medical reimbursement account, an employee should estimate projected yearly medical expenses as accurately as possible. Those enrolled in the Select Benefits program must have used the funds in the Select Benefits account by the end of the enrolled year. In the past, unused funds have been returned to the administration of the Select Benefits program, but starting in 1991 unused funds will be rolled into the grant/loan fund. Program participants are sent notices each November reminding them to check the balance in their reimbursement accounts. If an unused balance remains in an account as of November, the participant can schedule dental appointments, purchase eyeglasses, or apply other unreimbursed medical expenses toward the remaining funds before the end of that December.

Strategies for Tackling the Tough Times Employee Assistance Program Offers Suggestions



"I am having a hard time coping with everything that's happening right now. My only child, who is in the armed services, may be called up to go to Saudi Arabia any day now; my heating and gasoline costs have skyrocketed and I don't know how I'm going to make it through the winter financially; there is talk at the office about our possibly being some of those that might be laid off at Cornell, but nobody knows if and when that might happen; and with the recession on, I'm not sure I could get another job in the area, but moving is out of the question. On top of this, in less than two weeks the holiday vacation begins and instead of feeling happy I am totally depressed because of all this uncertainty hanging over me. What should I do?"

—Overwhelmed

This statement sounds like it might have come right out of Ann Landers' column, but many people in the Ithaca area have been dealing with one or more of these issues this fall. The Employee Assistance Program (EAP) can provide guidelines and strategies for dealing with these and other issues, and offers some of the following suggestions, as well as an invitation to call them at 273-1129 to set up an appointment to deal with difficult or stressful situations.

We often face situations over which we have little or no control. It is important at those times to identify the areas we can control and to take action in those areas so that we can continue to function.

Let's look at the problems about which this person (*Overwhelmed*) is concerned:

1. The possibility of an only child leaving to go into a potentially dangerous situation.
2. Finances related to work and the world situation.
3. Stress of the approaching holidays.

All of these concerns have piled up so that *Overwhelmed* (hereafter referred to as "O") is feeling depressed and uncertain. It is very possible that O is experiencing sleep and/or appetite changes. O may be so focussed on worrying

about these issues that he or she seems to have little energy left for other things, may be crying or getting angry more often, or may even feel that life is not worth living.

At this point, one positive response to this crisis would be for O to seek out support and perspective from others in a position to provide it, including the Employee Assistance Program (EAP). If O sought help at EAP, a counselor would listen to O's presentation of the problems, assess O's level of depression, and ascertain if O is totally emotionally overwhelmed. If O is experiencing serious depression or suicidal thoughts, the counselor will focus on these issues first, because O may not feel able to take positive and concrete actions until he or she can move past the immediate experience of overwhelming emotional stress.

As the treatment for emotional stress continues, O and the counselor might discuss what O has already done to take care of him or herself. People are often very creative about caring for themselves in times of stress. Unfortunately, we sometimes choose methods of coping that might be detrimental to our emotional well-being, such as the excessive use or abuse of substances or placing too much intensity and strain on relationships.

During times of severe stress it is essential that we create areas of our lives over which we have control (see the article that follows, "Change and Stress"). Therefore, a discussion with O about what is within his or her control would be helpful. For instance, O is not in control of the fact that his or her adult child will or will not go to the Middle East, but O can communicate his or her own feelings with the child and possibly share memories of times past. If the child is shipped out, O may make plans to help emotionally support the child.

The second problem on which O can take action is the area of finances. It would be helpful for O to get the facts about what can be done about his or her financial situation. A referral to a credit counselor (another service provided free

of charge through the Employee Assistance Program) to discuss current and/or eventual financial problems might be beneficial.

Since there may be a great deal of stress related to the possibility of being laid off at work, O might wish to talk to his or her supervisory personnel and/or contact the Office of Human Resources (Employee Relations, 255-7206; Staffing Services, 255-5226) to get a feel for the current situation. It might also be wise to read the layoff policies (available in the *Personnel Manual* through the Personnel Support Group representatives and at the reference desks at the Cornell libraries) and to contact the Employee Benefits Office (255-4455 Statutory; 255-3936 Endowed) to check the extent of the benefits that would be available should a layoff occur.

When a situation is so stressful that a person cannot continue to function under that level of stress, it sometimes helps to look at the alternatives that may be available. In other words, exploring the possibility of changing a career or job might be a good idea, even if O doesn't intend to follow up on making these changes unless absolutely necessary.

When people are stressed they sometimes express anxiety by talking excessively. While this might be good, it can also present problems at the workplace, where rumors, possibly based on actual facts, may spring up. It is difficult not to get caught up in others' anxiety, so a plan for O to focus on the issues as they are known and to take care of him or herself in high-anxiety situations is advisable.

The approaching holidays may be difficult for O to enjoy. Family members far away, or close by, may create stress. Finances are often strained during holiday seasons and an expectation that everyone be happy together may be unrealistic. Once again, a plan for O to take care of him or herself can be put in place. Talking about emotional needs with close family and friends and relying on other supports to

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Careers: Interviewing for Information

One technique that is often confusing to people and therefore underused is information interviewing. Information interviewing may be used for many different purposes. It can assist you with career exploration and decision-making by providing an in-depth view of a particular job or organization. It can also be used as a tool to gather information, contacts, and job leads. Through information interviewing you can ask questions that relate specifically to a situation. You can also gather information that may help you decide if a career/job/organization is the one for you.

In order to gather the most accurate information, you should interview people who are in occupations of interest. Remember that the same job may be very different depending on the type of environment or organization. Therefore, you may want to interview several people who are in the same occupation but in different organizations.

When starting the process, it is easier to begin by interviewing people you already know, and/or getting referrals from them. Do not overlook anyone: friends, relatives, colleagues are all potential information sources. If you do not know people who could provide you with pertinent information, identify an individual in an occupation of interest simply by calling an organization. Most people are very willing to grant information interviews. Be careful not to overuse people in this process.

When setting up the information interview, you should do it in a professional rather than casual manner. Be clear and honest about the reasons for conducting the interview. Remember, the person you are interviewing is a potential contact or referral. Therefore, you should dress and act professionally. Since you are setting up the information interview, you must take responsibility for it.

Although you are conducting these interviews to gather information, you should still do some general research prior to the interview. Reading career books, periodicals, journals and business reference guides will help you obtain general knowledge about the career field and compile well-thought-out questions.

At the end of each interview, ask for a referral of one or two other people who may be able to provide you with additional information. This is a good way to expand your network of contacts. Following up the informational interview with a thank-you letter will not only be professional, it will again remind the person of you and your situation.

Sample Questions

1. How did you prepare yourself for this work?
2. What do you do during a typical work week?
3. What skills or talents are most essential for effective performance in this job?
4. How much flexibility do you have in terms of dress, hours of work, vacation schedule, place of residence, and so forth?
5. What types of employers hire people with your background - what are some representative job titles?
6. How do people find out about these jobs?
7. If you were a college graduate again and had it to do all over, what would you do differently to prepare for this occupation?
8. What do you perceive to be the major rewards of the job?
9. What are the major frustrations in this job?
10. What job in the organization would you prefer above your own?
11. If you could change one thing about the organization, what would it be?
12. Based on our conversation today, can you suggest other people who may be able to provide additional information?

Questions About Information Interviewing

1. *I need to find a job as soon as possible. It seems like this information interviewing process will take a long time and is a roundabout method. I don't know if it seems worth the effort. Wouldn't it be better simply to apply for advertised jobs?*

Sources estimate that as high as 85 percent of all available jobs are not advertised. Therefore, if you are simply applying to advertised jobs, you are missing out on a number of potential opportunities. Once you start the information interviewing process, one interview can lead to the next and open up a whole network of information contacts.

Information interviewing is actually one of the most effective job search strategies. Once a job is advertised in the classified section, your resume may be one of hundreds in response. This greatly decreases your chances of obtaining the job. The possibility of getting a personal referral to

own tendencies and, if the individual reactions are unhelpful, to make a concrete plan to tackle these responses head-on. This approach is especially vital if one knows that a stressful period is approaching.

Often, people know when difficult times are likely to occur. It is important to take charge of whatever can be controlled and to accept that there may be many external factors that are out of control. A person should prepare in advance by doing whatever is needed to bring about some semblance of order and control.

Many people find that continuing to do activities which are normal parts of everyday life allow them to feel more secure and able to cope with the rigors of change. Continuing exercise programs or hobbies or engaging in other fulfilling activities can aid in allowing a feeling of being in control, even when many new things are happening.

Creating connections and maintaining a support network is vital to coping with extreme stress. Friends and family who are prepared to give the person under stress what that person needs may make the difference in the experience of change. For example, sometimes sharing difficult times with others leads to looking at the incidents in a different light. One should avoid isolating oneself at all costs; it will intensify the feelings of stress.

Often changes lead to a new, more productive chapter of life. Embracing the changes rather than shielding oneself from them will enable a person to come to terms with them quickly, and to see what good can come from the new. Crisis and opportunity very often come in the same package. If a person makes life happen rather than just letting it happen, a more satisfying future may be the result.

If you are experiencing a great deal of stress due to change or if you are finding any aspect of your life problematic, please call for an appointment at the Employee Assistance Program, 273-1129.

interview for a job through information interviewing is much higher.

2. *I don't feel comfortable calling people out of the blue to ask for an information interview. I am not an assertive person. How should I approach this situation?*

It does take some assertiveness to be successful at information interviewing. It may be easier for you to use a personal referral that would provide you with an introduction to the person you would like to interview. You may even ask the intermediate person to inquire if the person would be willing to do an information interview. Then when you call, you would already know the person is expecting your call and is willing to meet with you.

3. *I don't know anyone I could interview. I also don't know people who could make referrals. What should I do?*

You may know more people than you think. Many people overlook potential contacts because they don't think of people in their lives in other contexts. You should network or seek out potential contacts constantly with everyone you contact. You never know who may be able to lead you to something or someone of interest.

If you are doing everything mentioned above and still can not produce any contacts, call an organization and ask to speak with someone who is in the type of job in which you are interested. Ask if this person would be willing to meet with you to share information about the career field, job opportunities in this geographic area, and so forth. Make it clear that you are not asking for a job, but for information.

Adapted from an article by Gail Dupre, former director of The Career Connection, and used with permission. The article appeared in the July 25-31, 1990 issue of the GRAPEVINE.

Mary Fitzgerald is the new director of The Career Connection, a program of the Women's Community Building, 100 W. Seneca Street, Ithaca, N.Y. The Career Connection offers career counselling, job listings, job networking assistance, and a career resource library. Outplacement and spousal relocation services are also available. Hours are 9:30 a.m. - 1:30 p.m. Monday, Tuesday, Wednesday, and Friday, 4:00 - 7:00 p.m. Thursdays and 10:00 a.m. - 2:00 p.m. the first Saturday of the month. Call 272-0351 or 272-1247 for an appointment.

Strategies for Tough Times

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make the holidays meaningful but not overly stressful will be important to O's peace of mind and will affect O's level of energy as the new year approaches.

Working through powerful and distressing emotions, setting up plans for self-care, and creating strategies for dealing with complex situations may take a little while. As O discusses and implements plans for gaining what control is possible, however, O's depression will most likely abate and O will feel more able to cope with stress and change.

Your Employee Assistance Program is available to provide support and counseling during difficult, stressful times. Just give us a ring at 273-1129 and we will set up an appointment for you to meet and talk with a counselor. There is no cost or obligation to employees, and family members are also eligible for the service.



Change and Stress

Change and stress go hand in hand. At times of transition—births, death, leavings, changes in marital status—stress is inevitable. All changes—for better or worse—create stress. Stress is not necessarily bad; it can help a person be sufficiently prepared for a new situation or event. Too little stress will mean that a person might operate at a low level, whereas higher levels of stress can motivate.

People's responses to stress are idiosyncratic: some become lethargic, others frantic, some efficient, others disorganized. It is vital that each individual be very aware of his or her

English as a Second Language Offered Free to Cornell Employees

TST BOCES will be offering beginning to intermediate level English as a Second Language courses free for employees at Cornell. The course offers employees an opportunity to practice English speaking, reading and writing skills in an informal setting on campus. Discussions on similarities and differences among cultures and other topics of interest to the participants will also be included. Instructor Annie H. Kim looks forward to meeting you.

Dates: January 7 through March 4 (10 weeks)
and
March 18 through May 23 (10 weeks)

Time: Monday through Thursday, 4:45 - 5:45 p.m.

Place: 163 Day Hall (please use main entrance)

Registration will be during your first visit to class (ongoing enrollment). Questions regarding registration or participation can be directed to Lorraine McNett at 257-1551.

New Members Sought for ACSW

Applications are being sought for mid-year openings on the university's 21-member Advisory Committee on the Status of Women (ACSW). The committee makes recommendations on women's issues to the associate vice president for human relations and in recent years has addressed such issues as career development, pay equity, work and families, and sexual harassment. For more information, contact Carolyn McPherson, coordinator of women's services, at 255-3976. Members of underrepresented ethnic groups are encouraged to apply.

* * * Notice: Payroll Update * * *

Many employees will be affected by the "Budget Law" passed by Congress and signed by President Bush on November 5, 1990. Effective January 1, 1991 two major tax changes will take effect:

1. **Federal Tax Withholding** - Changes in tax rates and an increase in the personal exemption amount will affect some employees' federal tax withholding. If you anticipate that individual or family income will vary greatly from the current year earnings or if you had dependent changes, you should consider altering

your withholding by completing a new withholding certificate (Form W-4). You can obtain these certificates from your unit payroll representatives.

2. **FICA Withholdings** - Social security will be split into two segments called Medicare (hospital insurance) and FICA (old age survivor and disability insurance). Different withholding rates will be applied to wages earned as follows: Medicare will be withheld at 1.45 percent of wages earned up to \$125,000 and FICA will be withheld at 6.2 percent of wages up to \$53,400. The

combined rate of 7.65 percent is the same as the 1990 FICA rate.

3. **1990 Wage Statements - W-2's** - Payroll plans on mailing the 1990 W-2's on January 17 or 18 and employees should receive them a few days later. It is imperative that the address on the Payroll be correct so please look at your next check or direct deposit stub and verify your address. Corrections should be directed to the records section in the Office of Human Resources at 255-6883.

JOB OPPORTUNITIES

THE UNIVERSITY HAS CURRENTLY FROZEN POSTING, RECRUITMENT AND HIRING for most nonacademic positions. The freeze of statutory positions is a direct response to SUNY-imposed controls on expenditures to meet state budget shortfalls. Endowed positions are frozen to provide placement opportunities for current and future laid-off employees. Certain positions are exempted from the freeze, i.e., positions that have been defined as critical by the provost and senior vice president and those positions funded by non-state grants and contracts that have also been approved for posting by the appropriate dean.

In all cases, priority in filling the few positions that have been released for posting will go to individuals on layoff. If there are no current individuals on layoff who are qualified for these positions, departments may hire a temporary until additional layoff candidates are identified. Cornell employees may continue to send transfer applications for positions and Staffing is still accepting applications from external candidates. However, Cornell employees not on layoff and external applicants will be referred only if it is likely that laid-off individuals with appropriate qualifications will not be available.

Staffing Services, 160 Day Hall, Cornell University, Ithaca, NY 14853-2801
Day Hall: (607) 255-5226 East Hill Plaza: (607) 255-7422

Employees may apply for any posted position with an Employee Transfer Application. A resume and cover letter, specifying the job title, department and job number, is recommended. Career counseling interviews are available by appointment.

Requests for referral and/or cover letters are not accepted from external candidates unless specified in the ad. Candidates should submit a completed and signed employment application which will remain active 4 months. Interviews are conducted by appointment only.

Staffing Services will acknowledge receipt of all material by mail. Hiring supervisors will contact those individuals selected for interview by phone; please include two or more numbers if possible. When the position is filled, candidates should receive notification from the hiring supervisor.

Cornell University is an Affirmative Action/Equal Opportunity Employer.
 Job Opportunities can be found on CUINFO

Professional

Nonacademic professional positions encompass a wide variety of fields including management, research support, computing, development, finance and accounting, dining services and health care.

All external candidates must have a completed signed employment application on file with Staffing before they can be interviewed for a position.

Submit a resume and cover letter for each position, specifying the job title, department & job number. Employees should include an Employee Transfer Application.

Project Leader I (PT4308) Level 35 **Financial Systems Development-Endowed** **Posting Date: 11/29/90**

Organize, schedule and supervise the work flow of programmers working on user area applications. Maintain close communications with users. Investigate and evaluate outside software systems to determine the most economical and efficient way of integrating large subsystems into the current production system. Analyze user requirements so that they will be successfully incorporated within the overall user system. Determine detailed user requirements for proposals and get user acceptance of input and output forms.

Requirements: Bachelor's or equivalent in computer science or engineering. 3-5 years experience including extensive work with computers and design of major systems. A thorough knowledge of one of the following: COBOL, PL/I, IMS, ADABAS, or NATURAL. Knowledge of Cornell operating systems preferred. Send cover letter and resume to Sam Weeks.

Application Program Analyst II (PT4701) Lvl 33 **CHESS-Endowed** **Posting Date: 12/13/90**

Serve as consultant for the CHESS computing system. Develop and implement a user friendly interface for data collection software. Assist users and staff with computing problems. Maintain user accounts. Position flexible.

Requirements: Programming experience with FORTRAN and C. Experience with VMS and UNIX systems useful. Send cover ltr & resume to Sam Weeks.

Resource Coordinator (PT4303) Level 33 **Engineering/Dean's Office-Endowed** **Posting Date: 12/13/90**

Manage information system for the NSF Engineering Education Coalition. Coordinate and maintain information systems, instructional software, a master database of contacts and a network of workstations. Coordinate the coalitions database of interactive software, video, pictures, graphics and text material which is connected to a large network distribution system.

Requirements: Bachelor's in computer science or communication (or equivalent) with substantial knowledge and experience with computer networking is required. Programming experience with UNIX OS, FORTRAN, X-Windows or networking protocols is preferable. Send cover ltr & resume to Sam Weeks.

Application Programmer/Analyst II (PT4705) Lv 33 **Public Affairs Records-Endowed** **Posting Date: 12/13/90**

Design, develop, modify, maintain and document straight forward applications software of a major administrative system. Analyze functional and performance requirements and develop software alternatives to increase efficiency and usability. Diagnose problems in production software and effect emergency repairs. Install, document, maintain and modify straight forward vendor purchased applications software. Write production procedure, JCL, and user manuals. Assist and advise users.

Requirements: Bachelor's or equivalent with computer courses. 2-3 years related experience. Knowledge of applications for interactive and batch systems (administrative); database management systems; machine architecture; system utility programs;

and VM/CMS. Knowledge of at least two of the following languages: PL/I, Natural, COBOL. Send cover letter and resume to Sam Weeks.

Director of Law School Annual Fund (PA4603) HRII **Law School-Endowed** **Posting Date: 12/6/90**

The Director of the Law School Annual Fund works with the Law School's Assistant Dean for Development and Public Affairs in the development of programs for the school's annual fund and the leadership gifts program.

Requirements: Bachelor's degree. 5 years successful fund-raising experience in alumni campaigning. Management skills and refined organizational skills. Ability to motivate people and work creatively with volunteers. Send cover letter and resume to Cynthia Smithbower.

Assistant Director Class Programs (PA4703) HRI **Public Affairs-Endowed** **Posting Date: 12/13/90**

Work with volunteer class officers in the planning, coordination, and implementation of young alumni events. Assist reunion chairs for the fifth and tenth year reunions. Responsible for undergraduate class initiatives from alumni affairs, including senior year alumni class officer elections.

Requirements: Bachelor's required. 1-3 years experience. Good oral and written communication skills. Ability to direct and coordinate volunteers and their efforts. Strong organizational skills. Attention to detail. Excellent supervisory skills. Send cover letter and resume to Cynthia Smithbower.

Executive Staff Assistant (PC4707) HRI **Human Ecology Administration-Statutory** **Posting Date: 12/13/90**

Provide professional staff assistance to the Dean of the College. Handle many confidential matters. Prepare correspondence and other materials; compose some correspondence; handle heavy scheduling; arrange meetings; screen calls and visitors. Make travel arrangements and handle reimbursements.

Requirements: Bachelor's preferred; Associate's with extensive experience acceptable. Minimum 5 years experience in complex office environment. Excellent communication, interpersonal and organizational skills are essential. Experience dealing with confidential matters desirable. Experience with microcomputers required (IBFM preferred); familiarity with Wordperfect desirable. Ability to use dictaphone equipment. Good writing, editing and keyboard skills necessary. Regular Cornell employees only. Send employee transfer application, cover letter and resume to Esther Smith, Staffing Services, EHP.

Photo Specialist (PT4703) HRI **Media Services-Statutory** **Posting Date: 12/13/90**

Produce high quality photographs using 4x5 view cameras, 2 1/4, and 35mm in studio or on location for public relations, publication, exhibits and slide shows. Meet with clients to advise, plan content and to conceptualize photographs. Reproduce color slides using optical printer to produce special effects. Reproduce as slides or prints prepared artwork, illustrations and original photographs. Travel and wknd hours.

Requirements: Bachelor's in photographic arts and sciences or equivalent. 3 yrs experience in commercial photography, including photojournalism, studio photography, location photography and color process monitoring. Experience with optical printing methods preferred. Send cover letter & resume to Sam Weeks.

Research Support Specialist I (PT4509) HRI **Biochemistry/MAC CHESS-Statutory** **Posting Date: 11/29/90**

Supervise and manage the operation of the X-ray processing facility. Train users in the use of the laser scanner and the image processing software. Act as consultant/assistant in some experiments. Convert data acquisition hardware and software from DEC system to Macintosh.

Requirements: Bachelor's or equivalent in physical

science, engineering or computer science. Minimum 2-3 years of technical experience in electronics/computing. Software development experience (DecStation 5000, PDP11, MacII). Good working knowledge of computer interfacing and instrumentation. Send cover letter and resume to Sam Weeks.

Professional Off-Campus

Director (PA4602) HRII **Public Affairs Regional Ofc/Cleveland, OH-End.** **Posting Date: 12/6/90**

Director of Cornell University's North Central Regional Office. Plan, organize and direct a comprehensive regional public affairs program representing the University in its alumni affairs, development, public relations and alumni secondary schools activities. Recruit, train and manage an extensive alumni volunteer regional network in close coordination with the university's central public affairs & college programs.

Requirements: Bachelor's required. 5 years experience in public affairs, development, and/or alumni relations in higher education or a closely related field. Demonstrated managerial ability. Must have high initiative & self-starting ability, good organizational skills, and the ability to relate to a wide range of individuals. Send cover letter & resume to Cynthia Smithbower.

Assistant Regional Director (PA4601) HRI **Public Affairs Northeast Regional Office, Boston-Endowed** **Posting Date: 12/6/90**

Assist the Director of the Northeast Regional Office in assuring the implementation of the university's development, alumni affairs, college/unit Public Affairs, admissions and other programs that involve university alumni and friends.

Requirements: Bachelor's degree. 2-3 years experience in university development or alumni affairs. Send cover letter and resume to Cynthia Smithbower.

Professional Temporary

Associate Director for Alumni Programs/SDS IV (PA4301) HRII **Career Center-Endowed** **Posting Date: 11/1/90**

Coordinate Cornell Connection and Alumni Career advisory Network. Organize 3 alumni career fairs for seniors to take place in Washington, D.C., and New York City over spring break. Work with alumni chairpersons to plan fairs; recruit alumni participants, publicize events, administer budget, and advise students about the fairs and how to network with alumni. Coordinate follow up survey of participants in four winter break and three spring break career fairs. Oversee computerized job listing service and Alumni Career Advisory Network. Supervise two administrative aides and work study students. Full-time temporary until May 31, 1991.

Requirements: Master's or equivalent. 3-5 years experience of significant administrative responsibilities, preferably with alumni of students. Excellent writing, organizational, and interpersonal skills. Knowledge of basic word processing skills on Macintosh. Send cover ltr & resume to Cynthia Smithbower.

Technical

As a prominent research institution, Cornell University has a diverse need for laboratory, electro/mechanical and computer support. Individuals with backgrounds in computer science, biology, microbiology, chemistry, animal husbandry, plant science and medical laboratory techniques are encouraged to apply; applicants with ASCP or AHT licenses are in particular demand.

All external candidates must have a completed signed employment application on file with Staffing

before they can be interviewed for a position.

Submit a resume and cover letter for each position, specifying the job title, department and job number, to Sam Weeks, 160 Day Hall. Skill assessment check lists, available at the Day Hall office, are a valuable aid when applying for computer or laboratory related positions.

Technician, GR18 (T4506) **Chemistry-Endowed** **Minimum Biweekly Salary: \$529.35** **Posting Date: 11/29/90**

Synthesize and analyze organic compounds to be used in tests of enzyme inhibition. Follow procedures to prepare desired chemical compounds. Carry out spectroscopic analysis. Perform library research, write reports, and give presentations.

Requirements: Associate's in chemistry or equivalent. Minimum of 1 year in an organic chemistry lab. Send cover letter and resume to Sam Weeks.

Animal Technician, GR18 (T4707, T4708, T4709, T4711) **Laboratory Animal Services-Endowed** **Minimum Biweekly Salary: \$529.35** **Posting Date: 12/13/90**

Care, feed, water, clean and monitor research animals. Follow strict protocols for sterile or disease control environments and for animal welfare. Maintain animal records. Assist vets in treating and vaccinating as needed. Some wknd & holiday coverage.

Requirements: HS diploma or equivalent. Associate's in animal science desired. AALAS certificate helpful. Knowledge of a variety of lab animals and animal breeding required. 1 year experience. Ability to lift 50 pounds. Pre-employment physical, all necessary immunizations and NYS driver's license required. Send cover letter & resume to Sam Weeks.

Technician, GR19 (T3306) **Soil, Crop & Atmospheric Sciences-Statutory** **Minimum Biweekly Salary: \$551.86** **Posting Date: 8/23/90**

Assist with lab, greenhouse, and field studies of soil chemistry, water quality, and plant and animal nutrition. Perform chemical analyses on plant and animal tissue, soil, water, and other samples using ICP (inductively-coupled argon plasma) emission spectrometry, ICP mass spectrometry, atomic absorption spectrophotometry, ion chromatography, etc. Collect and prepare samples for analysis. Prepare standards and reagents. Verify purity of chemicals. Record and tabulate results. Enter data into computer and perform statistical analyses. Assist with library research. Check and maintain instrumentation. Maintain stock reagents and wash glass ware.

Requirements: Associate's in chemical technology (Bachelor's preferred) with training in analytical methods. Research experience; demonstrated aptitude for inorganic analyses and instrumental methods; familiarity with ICP emission spectrometry, ICP mass spectrometry, and ion chromatography; experience with Lotus and SAS is desirable. Send cover and resume to Sam Weeks.

Technician, GR20 (T4704) **Natural Resources-Statutory** **Minimum Biweekly Salary: \$575.30** **Posting Date: 12/13/90**

Assist in research to alleviate damage caused by deer and to evaluate deer repellents and new fencing. Design, conduct and evaluate studies of deer damage to crops and ornamental plantings. Assist in research on other wildlife damage. Prepare and present summary research reports. Assist in maintenance of research vehicles.

Requirements: Master's in wildlife science, mammalogy, vertebrate zoology, or animal science (or equivalent). Minimum of 2 years of related experience including work with herbivores, primarily whitetailed deer and rabbits. Experience in experimental design. Familiarity with PC's and statistical programs. Send cov letter & resume to Sam Weeks.

Laboratory Technician, GR21 (T4201)
Veterinary Microbiology-Statutory
Minimum Biweekly Salary: \$599.73
Posting Date: 10/25/90

Provide technical support to a canine hip dysplasia and osteoarthritis project by looking for RFLP's which may be associated with these conditions. Isolate and purify DNA; prepare cDNA probes; and use restriction endonuclease and northern blots. Prepare and maintain tissue cultures. Perform ELISA essays; ion exchange and affinity chromatography; and polyacrylamide gel electrophoresis. Prepare protocols and tabulate data. Maintain lab.

Requirements: Bachelor's in biochemistry, molecular biology, or microbiology (or equivalent). 1-2 years experience in molecular biological techniques, tissue culture and ELISA assays. Send cover letter and resume to Sam Weeks.

Technician, GR21 (T4501)
Division of Nutritional Sciences-Statutory
Minimum Biweekly Salary: \$599.73
Posting Date: 11/29/90

Assume complete and independent responsibility for the following: 1) Anesthetization and surgery, implant manipulations, excision, and postoperative care of rats. 2) Perform experiments with rats including behavioral observations and data collection. 3) Organize and supervise a breeding colony. 4) Supervise and train undergraduates conducting research. 5) Analyze data statistically and maintain computerized databases. 6) Perform library work. Position until 4/91 however continued funding is anticipated thru 4/94.

Requirements: Bachelor's or equivalent with background in biology or chemistry. Minimum of 2-3 years related experience in animal lab with supervisory responsibilities. Surgical experience is not necessary, training will be provided. Computer experience required for maintaining databases, data analyses, and colony records. Send cover letter and resume to Sam Weeks.

Technical Part-time

Animal Technicians, GR18 (T4706, T4710)
Laboratory Animal Services-Statutory
Minimum full-time equivalent: \$529.35
Posting Date: 12/13/90

Care, feed, water, clean and monitor research animals. Follow strict protocols for sterile or disease control environments and for animal welfare. Maintain animal records. Assist vets in treating and vaccinating as needed. Half time position requiring 1 week day plus weekends and holiday coverage. Sat/Sun, 7.8 hrs pr day, 20 hrs pr week.

Requirements: HS diploma or equivalent. Associate's in animal science desired. AALAS certificate helpful. 1 year experience. Ability to lift 50 pounds. Pre-employment physical, all necessary immunizations and NYS driver's license required. Send cover letter & resume to Sam Weeks.

Office Professionals

Approximately half of all University openings are for Office Professionals. Individuals with secretarial, word processing (IBM PC, Macintosh, Wang, Micom), data entry, technical typing, or medium to heavy typing (45-60+ wpm) are encouraged to apply.

All external candidates must have a completed signed employment application on file with Staffing before they can be interviewed for a position. Employee candidates should submit an employee transfer application and cover letter, if requested, for each position in which they are interested.

Submit a signed employment application & resume which will remain active for a period of four months. During this time, you will be considered for any appropriate openings for which you are competitively qualified. Requests for referral and/or cover letters are not accepted from external candidates unless specified in the ad. Qualified applicants will be invited for a preliminary interview at our EHP office. If you are currently available for employment, you may want to consider temporary opportunities at the university. Please contact Karen Raponi at 255-2192 for details.

Secretary, GR18 (C4516)
Engineering Minority Programs-Endowed
Minimum Biweekly Salary: \$529.35
Posting Date: 11/29/90

Provide clerical support for EMPO's Cornell Young Scholars Program and other EMPO staff. Word processing; mailings, duplication; filing; basic bookkeeping; serve as receptionist. Other duties as assigned. Mon-Fri, 8-4:30, 1 year appointment.

Requirements: HS or equivalent. Some college coursework preferred. Proficient on Macintosh Computer. 2 years related office experience. Good interpersonal and organizational skills. Ability to communicate with middle and HS students. Medium typing. Regular Cornell employees only. Send employee transfer application, cover letter & resume to Esther Smith, Staffing Services, EHP.

Senior Circulation/Reserve Assistant, GR18 (C4602)
Public Services/Law Library/CUL-Endowed
Minimum Biweekly Salary: \$529.35
Posting Date: 12/13/90

Under the general supervision of the Supervisor of Access Services, responsible for all daily operations of the Circulation Desk. Maintain circulation files, recall materials, handle fines. Open the Library. Mon-Fri.

Requirements: HS diploma required. Associate's preferred. 1-2 years related experience. Ability to work with a variety of people in a public service setting. Must be dependable, and work well under pressure. Good interpersonal, organizational, and oral communication skills. Regular Cornell employees only. Send employee transfer application, cover letter and resume to Esther Smith, Staffing Services, EHP.

Technician, GR18 (C4601, C4607)
Mann Library-Statutory
Minimum Biweekly Salary: \$529.35
Posting Date: 12/6/90

Perform a variety of tasks relating to the preservation of brittle materials as part of a project to preserve the Entomology collection of library materials. Prepare materials for reformatting to preservation microfilm and/or preservation photocopy and quality control. May also participate in other conservation treatments to extend the useful life of the collection including

minor repair and making protective enclosures for damaged books. One year appointment.

Requirements: Associate's or equivalent combination of education and experience required. Relevant experience may include problem solving, work with historic or fragile objects or highly detailed work involving close concentration and attention to detail. Good interpersonal, organizational, communication, and oral skills required to effectively work with filmings agent and other library departments. Micro-computer and previous library experience desirable. Experience with microforms, bibliographic searching and book conservation desirable. Send cover letter and resume to Esther Smith, Staffing Services, 160 Day Hall.

Literature Project Assistant, GR19 (C4512)
Mann Library-Statutory
Minimum Biweekly Salary: \$551.86
Posting Date: 11/19/90

Under the direction of the Core Literature Project Director, assists in the compilation of subject bibliographies of historic materials to be used for preservation purposes. Duties include bibliographic searching, use of database management software, editing and verifying of bibliographic information. Some administrative support. Position until 6/23/93.

Requirements: Associate's or equivalent education required. Computer experience including wordprocessing ability required. 1-2 years experience searching bibliographic databases, including RLIN & NOTIS highly desirable. Experience with database management software (particularly Procite) desirable. Ability to be self-directed and to meet deadlines and attention to detail are essential. Send cover letter and resume to Esther Smith, Staffing Services, 160 Day Hall.

Accounts Assistant, GR20 (C4104)
Electrical Engineering-Endowed
Minimum Biweekly Salary: \$575.30
Posting Date: 10/18/90

Process school payroll, assist in management of accounts, and assist administrative associate.

Requirements: Associate's in business or related field. 2-3 years business experience. Ability to work under pressure and as part of a team. Experience using Lotus 123 on IBM PC. 1-2 years Cornell University payroll experience. Regular Cornell employees only. Send employee transfer application, cover letter & resume to Esther Smith, Staffing Svcs, EHP.

Administrative Aide, GR21 (C4519)
Physiology-Statutory
Minimum Biweekly Salary: \$599.73
Posting Date: 11/29/90

Assist Administrative Manager with day to day operation of the department section of Physiology. Responsible for all personnel and payroll functions; assist in preparation of annual budget and the compilation of various teaching and research oriented reports.

Requirements: Associate's or equivalent. Minimum 2 years related experience. Ability to work well under constant pressure with diverse personalities and at all academic, non-academic, and administrative levels. Excellent organizational skills. Knowledge of Cornell personnel policies and procedures and statutory and endowed accounting procedures. Familiarity with grant management. Supervisory ability. Word processing, Lotus 123. Regular Cornell employees only. Send employee transfer application, cover letter and resume to Esther Smith, Staffing Services, EHP.

Administrative Aide, GR21 (C4505)
Office of the University Registrar-Endowed
Minimum Biweekly Salary: \$599.73
Posting Date: 11/29/90

Coordinate and provide services to students, alumni, staff and external organizations and agencies. Handle complex nonstandard problems and/or requests as need arises; coordinate the appropriate dissemination of publicly available information on students, certify restricted student information at the student's request, and register students for the current semester.

Requirements: Associate's or equivalent. 2-3 years related experience preferably in an academic environment. Strong supervisory and customer service skills essential. Ability to use independent judgment and handle highly confidential information. Excellent communication, interpersonal and organizational skills. Experience with word processing and database management, preferably on Macintosh. Regular Cornell employees only. Send employee transfer application, cover letter and resume to Esther Smith, Staffing Services, EHP.

Accounts Assistant, GR22 (C4502)
Controller's/Accounting-Endowed
Minimum Biweekly Salary: \$625.24
Posting Date: 11/29/90

Prepare and maintain various computer generated reports. Assign and establish Sponsored Programs Accounts; review budget categories and prepare preliminary analysis for financial reports; follow up on overdrawn accounts and outstanding accounts receivables.

Requirements: Associate's in accounting or business. 3-4 years related experience in accounting. Cornell experience preferred. Grant and contract experience desirable. Experience with personal computers and Lotus 123. Regular Cornell employees only. Send employee transfer application, cover letter and resume to Esther Smith, Staffing Services,

EHP.

Office Professionals Temporary

In addition to posted positions, temporary opportunities occur in many occupational areas, including secretarial, word processing, accounting, and office administration. All individuals are encouraged to apply; experienced applicants with a typing speed of 45-60 wpm, knowledge of IBM-PC Word Perfect software and Macintosh word processing are in particular demand. Call Karen Raponi at (607) 255-2192 or 255-7422 for more information.

Student Development Specialist IV (\$4510)
Cornell United Religious Work-Endowed
Posting Date: 11/29/90

Assist with administration of community service volunteer and work/study programs. Interview and screen prospective students and set-up appointments with non-profit organizations in Tompkins County. Assist with follow-up and record keeping necessary for Annual Report.

Requirements: Master's or equivalent in Social Science. Some related experience in IBM Computer (Word Perfect, Lotus 123). Volunteer experience and knowledge of human service organizations in Ithaca area. Send cover letter and resume to Karen Raponi, Staffing Services, 160 Day Hall.

Office Assistant (\$4511)
Asian Studies-Endowed
Posting Date: 12/6/90

Maintain files and correspondence involved with 4 faculty promotion reviews, 1 faculty position search. Assist department secretary with position search. Assist department secretary with obtaining and updating information for the preparation of the department's annual catalog copy. Must have medium typing and knowledge of WordPerfect. Accuracy, excellent communication and interpersonal skills desired. Casual, Mon-Fri, 1:30p.m to 4:30p.m. January 15, 1991 - May 31, 1991. Please send cover letter and resume to Karen Raponi, Staffing Services, 160 Day Hall.

Casual Animal Technician (\$4611)
Laboratory Animal Services-Statutory
Posting Date: 12/13/90

Provide wknd & holiday care of lab animals (feed, water, clean & monitor following strict protocols for sterile or disease control environment and regulations for animal welfare. Maintain animal records. May include assisting Vets in treating and vaccinating animals. Sat-Sun-Holidays, 16 hrs per wk.

Requirements: HS diploma or equivalent required. Associate's in Animal Science desired. Assistant Animal Certificate helpful. Knowledge of a variety of lab animals and animal breeding required. 1 year animal experience. Ability to lift 50 pounds. Pre-employment physical and all necessary immunization required. Please send cover letter and resume to Karen Raponi, Staffing Services, 160 Day Hall.

General Service

Send application materials for the following positions to Cynthia Smithbower, 160 Day Hall.

General Service-Temporary

Greenhouse Worker, (B4701)
Entomology-Statutory
Hiring Rate: \$6.00
Posting Date: 12/13/90

Responsible for operation of an entomological greenhouse complex for use by faculty, staff, and graduate students. Anticipate and carry out necessary operations to maintain an optimum environment for plant growth and research needs. 3 months (possible extension). Mon-Fri 39 hrs pr wk.

Requirements: Bachelor's in floriculture or related field where coursework included plant growth and greenhouse operations; DEC certified application license required. 2-3 years working experience in a well managed greenhouse operation; excellent knowledge of mechanical operations of a greenhouse. Send materials to Cynthia Smithbower, Staffing Services, 160 Day Hall.

Academic

Extension Associate IV
Division of Biological Sciences
Cornell Institute for Biology Teachers

This new position of Extension Associate IV will be funded by a 3 year NSF Teacher Enhancement Grant. The Cornell Institute of Biology Teachers (CIBT) consists of two parallel three-week summer residential programs for HS biology teachers, one in Molecular Biology and one in Ecology and Evolution. Reporting to the Coordinator of CIBT, the extension Associate will have primary administrative responsibility for

planning and implementing the Ecology and Evolution component of CIBT. In addition to teaching biology labs and leading field trips during the summer program, the associate will assist in developing and modifying labs suitable for use in the HS biology classroom. Responsibilities include conducting educational outreach activities for HS biology teachers at upstate New York schools, Area Teacher Centers, BOCES and at Cornell; maintaining a support system for CIBT participants through a computer network; several CIBT return-to-campus meetings and on-site classroom visits.

Requirements: Doctorate in Biological Sciences preferred, specifically in Ecology, Evolution, or Organismal biology. Experience teaching college and HS level biology preferred. Writing and editing skills essential. Excellent interpersonal skills. Administrative experience useful. Position available ASAP. Send cover letter with vita and three references to Dr. Rita Calvo, 301 Biotechnology Building, Cornell University, Ithaca NY 14853.

Institute Director
College of Veterinary Medicine

Applicants are sought for the Directorship of the James A. Baker Institute for Animal Health, a unit of the New York State College of Veterinary Medicine at Cornell University in Ithaca, New York. The Baker Institute has a distinguished history of accomplishment in animal health research, with continuing emphasis on studies of canine diseases. The Institute includes eight senior staff, excellent laboratory and animal facilities, and is well equipped for biological research. The successful applicant will have proven leadership in research and teaching and will hold a faculty appointment in the College of Veterinary Medicine at the rank of Professor. The Director is expected to maintain an active research program. Important duties will include faculty development and graduate education, and support of activities which enhance public and private support of the Institute. Veterinary qualifications and/or experience in the field of animal health are desirable. Please send letter of interest with resume and names and addresses of 3 references to Dr. Fred W. Quimby, Dept. of Pathology, NYS College of Veterinary Medicine, Cornell University, Ithaca, NY, 14853, USA. The search committee will begin to review applications on Jan. 1, 1991. Cornell University is an affirmative action/equal opportunity employer.

Senior Research Associate I

Department of Theoretical & Applied Mechanics
 Perform both theoretical and experimental original research in the area of composite materials and structures. Develop mathematical models and experimental procedures for the strength and lifetime in stress-rupture of advanced fiber reinforced composites. Plan and supervise a project to design and implement laboratory equipment to study stress-rupture in a graphite/epoxy composite. Interact with other faculty in interdisciplinary research and student advising, along with externally funded research. Development and teaching of a laboratory course in composite materials and structures for the Department of Theoretical and Applied Mechanics M. Eng. program, including supervision of student research projects.

Requirements: Ph.D. in Applied Mechanics or Structural Engineering. Strong theoretical background in the area of composites. Extensive experience in fabrication and test methods of advanced composites. Strong background in probability and statistics, familiar with statistical modeling and analysis techniques such as Weibull analysis as applied to strength and fatigue life data. Knowledge of finite element analysis and software packages for laminate analysis and composite structures. Teaching and student supervising experience. Good research record. Send cover letter and resume to S.L. Phoenix, Department of Theoretical and Applied Mechanics, 248 Carpenter Hall.

Weight Watchers at Work Program

If you have made a New Year's Resolution to lose weight this year, here's your chance to really make it work. A new eight week Weight Watchers at Work program will begin on Wednesday, January 2, 1991 from 12:00 noon to 12:45 at Anabel Taylor Hall auditorium.

All employees are invited to attend. Come to the last meeting on December 19 for more information and to pre-register or call Weight Watchers toll-free number at 1-800-234-8080.

Cornell Employment News

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