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Two biology majors receive hands-on laboratory experience while doing organic grafting experiments in chick embryos.

Thrill of discovery
Selling science by involving undergraduates in research

On Jane Wiechert's first day as a student laboratory technician at Washington University, she was greener than the soybean plants she would be working with. "I had a little laboratory experience in a job and in science courses, but nothing with much responsibility," says Wiechert, recalling that first day in May 1986. "I kept thinking, 'I hope I'm good enough to do this.'"

By her graduation last May, Wiechert had co-authored a paper with postdoctoral fellow Mary Tierney. Working side-by-side, they discovered a new protein, P35, that inhibits the cell walls of soybeans and carrots. Although the researchers are not yet sure what role the protein plays, they think it defends the plant when it is injured.

Like Wiechert, today's undergraduates are a new breed of student who gets on-the-job training well before committing to a career. Involving undergraduates closely in high-level research—the norm rather than the exception at Washington—is both a trend and part of a campaign to make the test tube attractive again.

Wiechert, who currently is a medical research technician in the cell biology and physiology department at the medical school, is proud of her research. "Somebody this protein may be genetically engineered to make plants sturdier and more resistant to weather stress," she says. "I never dreamed I'd be doing research at this level so soon."

Her duties as a lab technician ran the gamut from cleaning the laboratory to purifying plant proteins and working with $^{14}C$—a radioactive isotope that labels plant DNA. Her experience is considerably more advanced than that of most college biology majors, and, just a decade ago, her opportunity to work so closely with a senior researcher was rare on most college campuses.

Not only is the number of college-age students declining, but reports also indicate fewer are majoring in science and mathematics. Add these disturbing facts to the impending teacher crunch in college sciences, already keenly apparent in secondary schools, and it is clear that the call to glory in the world of science is not exactly a siren song to the college student of the 80s. In fact, the U.S. science community is so concerned about the future of the sciences that the National Science Foundation is spending $38 million this year to support 2,000 research projects nationwide, involving undergraduate students at many schools including Washington.

About 40 percent of our serious biology students—those who go on to higher degrees—participate as members of a laboratory team," says Joseph Varner, Ph.D., the biology professor responsible for both Wiechert and Tierney's work at Washington. "It has been going on for years. They start humbly, sweeping floors and washing glassware, then go on to substantive participation in research that can result in listings as co-authors in professional journals. In any given semester, about 40 undergraduates work in our biology laboratories.

The students, says Varner, "become part of the laboratory's working team, attending weekly meetings and even giving talks. They are automatically included as part of our science community's social life."

This philosophy extends to the physics department, where one undergraduate recently co-authored a paper accepted by Astrophysical Journal. In the University's earth and planetary sciences department, undergraduate students often accompany professors on research expeditions to unravel clues about the earth's metamorphoses and genesis. Department laboratories also are familiar grounds for many undergraduates.

Such a "hands-on" approach to the study of science is desirable today not only to better enlighten budding scientists about their crafts but to sell them on the sciences.

"We want the word out that science is a dynamic endeavor, not just a process of memorization and textbook problems," says Larry Haskin, Ph.D., chairman of the earth and planetary sciences department. "We are telling the young people that as established scientists retire during the next 15 years and science fields expand, there will be tremendous opportunities for people who want to study earth and the planets."

"If we recognize that North American resources are becoming depleted, that energy costs must increase, that environmental problems require solutions and that early next century we will need to use lunar resources in near-earth space, it's clear why the next generation of scientists have such a challenging task."

Award-winning author, physicist to deliver lecture
Freeman Dyson, professor of physics at the Institute for Advanced Study, Princeton, N.J. will deliver the Washington University Fall Honors-Ferguson Lecture at 11 a.m. Wednesday, Sept. 23, in Graham Chapel.

His lecture, titled "Engineers, Dreamers, Tryers, and Duffers: Why Some Things Work and Others Don't," is part of the University's Assembly Series and is open to the public.

Dyson's book, Weapons and Hope, about the possibilities of dialogue between the military establishment and the peace movement, was awarded the National Book Critics Circle Award for Non-Fiction in 1984. Newsweek magazine termed the book, "A meditation of lyrical beauty, striking wisdom and steady moral passion."

His most recent book, Origins of Life, was published in 1986.

A native of England, Dyson helped design the TRIGA reactor and ORION spaceship from 1956-1959 at General Atomic in San Diego, Calif.

A member of the U.S. National Academy of Sciences, Dyson frequently serves as a consultant to the United States Space Agency and the Defense Department.

Among his many awards and honors, Dyson received the Wolf Prize in physics from the Wolf Foundation in Israel, and the Oppenheimer Memorial Prize from the Center for Theoretical Studies.

The Fall Honors Lecture recognizes students whose achievements in scholarship and service to the University have been recognized by honor organizations and by the academic divisions of the University.

The Ferguson Lecture, established in 1961 by the late William C. Ferguson, provides for an annual lecture on any scientific topic except the military uses of atomic energy.

For more information about the lecture, call 889-5285.

Career search workshop set
The Plymouth Career Search Workshop, sponsored by Business Week Careers magazine, will be held at both noon and 4 p.m. Friday, Sept. 25, in Lambert Lounge, Mallinckrodt Center.

The presentation is free and open to all members of the campus community. The event provides soon-to-be graduates with the basic tools necessary to begin their career search.

The workshop covers all aspects of the career search process, from self-presentation to interview, resume and follow-up techniques. The workshops, an entertaining mix of live presentation and video, are staffed by a team of experts from Business Week Careers.

The Plymouth Guide to Building a Resume, workbooks and other materials will be available.

For more information about the workshop, call 889-5940.
Books that made a difference to 55 faculty and administrators on exhibit

"A Community of Readers: Books That Made a Difference," an exhibit of books selected by distinguished faculty and administrators at Washington University, will be on exhibit from 8:30 a.m. to 5 p.m. weekdays, Sept. 16 through Dec. 31 in Olin Library's Special Collections, level 5.

The exhibit will display books selected for their influence on the 55 faculty and administrators who participated. The selections will be exhibited with written commentary by each participant. The selections range in diversity from books on accounting to poetry.

Faculty and administrators who have participated in the exhibit selection include: William D. Danforth, chancellor; W. Maxwell Cawan, Ph.D., provost; Robert L. Virgil, D.B.A., dean of the School of Business; Thomas F. Eagleton, University Professor of Public Affairs and Political Science; Harold Ellis, Ph.D., assistant professor of history; Udo Klawitter, Ph.D., Ruth and Norman Moore Professor of Architecture; Howard Nemover, Edward Mallinckrodt Distinguished University Professor; Seymour Pollack, professor of computer science; Gerhard Scholz Williams, Ph.D., associate professor of Germanic languages and literatures; and Samuel I. Weissman, Ph.D., professor of chemistry emeritus.

The exhibit is free and open to the public.

For more information, call 889-5487.

Restored Asian art is lecture subject

Steven Owyong, curator of the Asian art collection at The Saint Louis Art Museum in Forest Park, will give a slide lecture on the collection at 2:30 p.m. Friday, Sept. 18, in The Friends Room, located on the third floor via the auditorium entrance. The presentation, which is titled "Waking the Dragon," is free and open to the public. It is sponsored by the Asian Art Society of Washington University.

After more than a decade in storage, the Asian art collection will reopen to the public in November. The collection features important ancient Chinese bronzes and Buddhist sculptures. Paintings recently underwent extensive preparation for their permanent exhibition in eight galleries of the museum's restored west wing. Owyong's lecture will highlight the collection's most intriguing works of art.

For more information, call the Washington University Department of Chinese and Japanese at 889-5156.

A view from Capitol Hill

Learning legislative process by being where the action is

Spring 1987 was Wendy Z. Wood's "most thrilling semester in law school." Woods, who received a law degree from Washington University in May, was one of 23 participants in the university's Congressional Clinic. The congressional internship program, founded and supervised by Dr. Robert L. Virgil, M.B.A., L.L.B., Walter D. Coles Professor of Law, allows third-year law students to take part in the congressional legislative process via work on Capitol Hill each spring semester.

Most of the students work for members of Congress or congressional committees. This year marks the 10th anniversary of the clinic. Although students from other law schools live and work in Washington, Bernstein says the University's law school boasts the only full-time, supervised congressional internship program in the country.

As part of her work for Sen. Howard M. Metzenbaum, D-Ohio, Woods helped draft a bill designed to protect employee whistleblowers who disclose federal law violations. The bill is in the preliminary stages and has not been introduced in Congress. She also attended committee hearings and helped write a 50-page committee report based on a bill that would notify workers of occupational diseases.

Woods, an native of Emporia, Kan., says the Congressional Clinic "allowed me to use my legal skills in a professional way — not just as a student. The clinic took me away from the student environment and placed me in a real life environment where the decisions I made affected other people's lives."

Christie M. Quick, a May law graduate who also participated in the clinic this past spring, agrees. She says the clinic was "very beneficial in terms of giving students a chance to experience the legislative process in an important way. Many of us were doing very important work; not simply busy work. That was helpful for law students — to participate in the process which gives rise to the laws we are called upon to enforce."

Quick helped draft legislation for the House Judiciary Subcommittee on Criminal Justice, chaired by Rep. John Conyers Jr., D-Mich. She worked on changes to the criminal code and the federal anti-racketeer law. The Memphis, Tenn., native additionally helped the subcommittee staff prepare for congressional hearings by writing questions for committee members and summarizing witness testimony.

Quick's work was cited in the June 22, 1987, issue of the Congressional Record, a daily publication of the proceedings of Congress. The record quoted Rep. Dan Glickman, D-Kan., during a Jan. 27, 1987, session of the U.S. House: "I want to acknowledge the work of Christie Quick, an intern from Washington University in St. Louis," Glickman said. "Ms. Quick's work was excellent and reflects well on the Washington University law school."

During the fall semester at the University, Bernstein meets with the students as a group to prepare them for their work in Washington. During the spring semester, he travels to Washington every two weeks to work with the students. In individual meetings in Washington, the professor discusses the students' office assignments and offers guidance in fulfilling them. Office supervisors review the students' work in Washington. The congressional clinic constitutes the students' entire spring semester's work.

In addition, Bernstein, a national expert in labor law and social insurance legislation, critiques "everything each student writes. I comment on content, logic, clarity, style and organization." Admission to the clinic is based primarily upon the students' determination, work independence, conduct research and write effectively.

"The clinic is keen for the Washington internship. Bernstein says 20 percent of the third-year class applied for it this year, "but only those who can be accommodated."

Due to the program's popularity, he supervised 23 students this past spring, six more than the usual 17. The clinic also will place 24 students in 1988. A total of 151 students have participated in the program since it began in 1978.

According to Bernstein, who has held several Capitol Hill positions, the congressional clinic is designed to "make students aware of what lies below the legislative surface. As a law teacher, I feel it's of prime importance that lawyers learn more about the legislative process. I don't think law schools do as much to acquaint people with legislation as they should. I'm happy Washington University is in the forefront."

Although the competition is fierce for law students who want to work in Washington after graduation, clinic experience can help them open more doors. Since the program's inception, about 15 alumni have secured full-time jobs on Capitol Hill and approximately another 17 have obtained jobs elsewhere in the Washington area.

In addition, Bernstein, a national expert in environmental law, works for the Senate Committee on Environment and Public Works this past spring. He is now a staff assistant with the committee and continues to work for Sen. George J. Mitchell, D-Maine. As an intern, Goo interviewed and selected witnesses for hearings on Mitchell's acid rain bill, which is currently in the Senate. He now is involved in building support for the bill in Congress.

"The Congressional Clinic is a really good experience for people who want to come to Washington," says Goo. "It would be the best thing for me. I was interested in environmental law. I knew I wanted to get out of school, it's hard to get experience in that area. The clinic provides students with a wide variety of contacts and another chance to feel comfortable. If I had not participated in the clinic, my chances of securing a position with the committee would have been almost nil."
Busch Companies. The book describes a study of 306 children who had one or both of their parents diagnosed as mentally ill. The authors found that although childhood behavior disorders are associated with the complex and often interrelated factors, the foremost are the at-risk child's relationship with his or her mother, the concentration of mentally ill persons in the child's current family, and the child's ability to participate in social activities such as clubs, sport teams and hobbies.

W. Murray Underwood, associate professor of chemical engineering, recently was awarded the Horace Mann Award for 1987 at the Missouri Agricultural and Mechanical College held at Lake of the Ozarks. The award is given to individual contributors to public education. Underwood's award was presented for his involvement in last summer's witchcraft case at the Meramec Valley R-3 School District. "It was felt that my attendance (as representative of the American Civil Liberties Union) at all the meetings, my public statements and my letter to the superintendent of schools, headed off what might well have been another Mozert vs. Hawkins County Supreme Court case," he said. In that case, still under litigation, similar charges were brought against the school. In the Meramec Valley case, Underwood says, parents charged that the school was teaching witchcraft and the religion of scurial humanism.

Richard J. Walter, Ph.D., professor of history, has been elected to serve on the Board of Directors of the American Historical Association held Aug. 30-Sept. 1 in New York.

Michael A. Gomez, assistant professor in African-American Studies and the history department, has been awarded a Fulbright grant to Senegal. Gomez will take a leave of absence from Washington University during the 1987-88 academic year to conduct research and study in Senegal.

Charles L. Levin, Ph.D., professor of economics, attended the 27th European Congress of the Regional Science Association, held Aug. 25-28 in Athens, Greece. He presented a paper on "Changing Urban Purposes in Historical Perspective" at a session in memory of the late Professor Morris Hill, founder and chairman of the Department of City and Regional Planning at the Technion University in Haifa, Israel.

Thomas Schiff, D.M.D., associate professor, Department of Dental Diagnostic Services and head of the radiology section at the School of Dental Medicine, was a guest lecturer at Colgate Palmolive Co. during a bacteriological fermentation process. He then became head of biological research for Buckeye Incubator Co. in Springfield, Ohio, where he developed new methods for the feeding and brooding of baby chicks and young poultry.

In 1929 he joined Anheuser-Busch in St. Louis as a bacteriologist, where he organized a bacteriological department, developed pure culture manufacturing processes, and initiated a special library for the literature and patents related to company activities.

A holder of four patents himself, including a process for producing acetic and butyl alcohol, Freiberg eventually became coordinator of research and patent information for Anheuser-Busch until his retirement in 1975.

Mrs. Windegger established the Jeanette L. Windegger Foundation in 1982. The fund provides scholarships for St. Louis metropolitan area college students. The awards are made on the basis of character, scholastic achievement, leadership, and financial need. Qualified students must be St. Louisans who are likely to remain in the area and contribute to the community. At this time, more than 175 Washington University students have benefited from the foundation.

Mrs. Windegger has donated funds to renovate the chapel at Gatesworth Manor, and she also established a camp for handicapped children. The Jeanette L. Windegger Pavilion at Tilles Park also was built through her generosity in 1978.

The daughter of George E. Windegger, a St. Louis Globe Democrat employee for 45 years, Mrs. Windegger has traveled around the world, including a trip to China in 1954.

She says the idea to establish the scholarship foundation came to her in a dream. "It was just the Lord's way of bringing out what was already in my subconscious mind," Mrs. Windegger said.

Have you done something noteworthy?

Washington University faculty and staff make news around the globe. Following is a digest of media coverage during recent weeks for their scholarly activities, research and general expertise.

"Rudimentary" is the term William A. Peck, M.D., John E. and Adeline Kane Professor of Medicine and associate chairman of medicine, uses to describe our understanding of the risks and causes of falls — the leading causes of fatal injuries among senior citizens. In the article that appeared in the Aug. 15 issue of the Staten Island Advance, he suggests safety precautions seniors should take to avoid falling.

"There is definitely a trend nationally for universities to be open to relationships with industry," says Edward MacCordy, associate vice chancellor for research, in a July 24 Science article. MacCordy is a professor of computer science and industry-university research agreements. His comments were part of a speech delivered at a recent meeting of the National Council of University Research Administrators.
CALENDAR

Thursday, Sept. 17
2:30 p.m. Dept. of Mechanical Engineering Colloquium: "A Tool for the Kinematic of Open-Chain Systems." James A. Schaaf, instructor, dept. of mechanical engineering, U. of California-Davis.
5:30 p.m. Dept. of Chemistry Seminar, "Molecular Recognition in Carcinogenic Acrylamides." Richard Gaudine, prof. of chemistry, Louisiana State U. St. Milliken.
8 p.m. Dept. of Germanic Languages and Literatures Poetry Reading with Richard Exact, prof. of German, U. of California-Santa Barbara.
8:30 p.m. Dept. of English Colloquium, "Soccer." Yuri Yuril, assoc. prof. of English. Burnt Lounge, Duncan Hall.
Friday, Sept. 18
4 p.m. Dept. of Biology Seminar, "Genetic Analysis of Nodule Development in Alalfa." Sharon Long, dept. of biological sciences, Boston U. School of Medicine.
10 a.m. Western European Studies Program Lecture, "French Debate: The Decision Between the United States and the European Community." Gustav Quidde, prof. of law, U. of Paris and counselor to the European Community Commission. Burnt Lounge, Duncan Hall.
1:30 p.m. WU Asian Art Society Lecture, "Walking the Dragon." Steven Osowky, curator, Asian Art Museum. The Friends Room, St. Louis Art Museum.
Monday, Sept. 21
Tuesday, Sept. 22
5 p.m. Fifth Annual Freeman Dyson Lecture in Cardiovascular Disease, "The Evolution of Understanding the Role of Hypertension in Primary Arterial Disease." William B. Kennedy, chief, Section of Preventive Medicine and Epidemiology, Dep. of Medicine, Boston U. School of Medicine. Weill Auditorium.
Wednesday, Sept. 23
11 a.m. Fall Honors/Pfungst Lecture, "Engineers Dreaming to Understand Why Some Things Work and Others Don't," Freeman Dyson, prof. of physics, Institute for Advanced Study, Princeton, N.J. 204 Crow.
5:30 p.m. School of Medicine Lecture Series on Alzheimer's Disease, "Evidence for Genetic Role in Alzheimer's Disease." John Henson, prof. of cell biology and physiology, John Morris, prof. of neurology, and Karen O'Malley, prof. of neurology. East Pavilion Aud.
Thursday, Sept. 24
4 p.m. Central Institute for the Deaf (CID) Research Seminar, "The Constitution and Neuroscience: Crime Control and Individual Rights." Professor of law at St. Louis University; and Lincoln and Individual Rights.
4:30 p.m. CID Research Seminar, "The Constitution and Neuroscience: Crime Control and Individual Rights." Professor of law at St. Louis University; and Lincoln and Individual Rights.
Friday, Sept. 25
7:30 and 9:45 p.m. WU Filmboard Series, "Don Quixote de la Mancha." S.2 Brown Hall. (Also Sat., Sept. 26, same time, and Sun., Sept. 27 at 9:15 p.m. Brown.)
Saturday, Sept. 26
10 a.m. Fall Honors/Pfungst Lecture, "Engineers Dreaming to Understand Why Some Things Work and Others Don't," Freeman Dyson, prof. of physics, Institute for Advanced Study, Princeton, N.J. 204 Crow.
10:30 a.m. Women's Tennis, WU vs. Evansville. Tennis Center.
1:30 p.m. Football, WU vs. Rose-Hulman Institute. Francis Field.
Sunday, Sept. 20
2 p.m. Soccer, WU vs. Kans College. Francis Field.
Tuesday, Sept. 22
5:30 p.m. Women's Tennis, WU vs. St. Louis U. Tennis Center.
Saturday, Sept. 26
10 a.m. Women's Tennis, WU vs. Simpson State U. Tennis Center.
MISCELLANY
Sunday, Sept. 20
1:30-4:30 p.m. 10th Annual Constitutional Conference, "The Constitution and Neuroscience: Crime Control and Individual Rights." Professor of law at St. Louis University; and Lincoln and Individual Rights.
Noon and 4 p.m. Plymouth Career Search Workshop, sponsored by Business Week Careers magazine. Lounge, Mallinckrodt Center. For more info., call 800-930-9301.

Selling science

Continued from p. 1

Thus, scientists themselves say the timing is right for young people to move into science as a career.

Haskin, who sees a potential dearth of planetary scientists by the turn of the century, says students entering college may be looking over long-term trends in searching out a career.

"Sometimes it takes up to eight years to graduate from undergraduate school for a scientist to become fully established," he says. "Eighteen-year-olds are looking for a career, but the science is still young, still changing rapidly. Students now can't be professionals eight years after graduation as they might in other sciences. There will be opportunities over the next 15 years for the dedicated, committed scientists who know the basics. We hope that laboratory and research opportunities make them aware of those career choices.

Tony Fitzpatrick

Crime control is focus of conference

Crime control and individual rights will be explored during a conference that will be held from 1:30 to 4:30 p.m. Sunday, Sept. 20, in Room 316 at the Washington University law school.

The 10th annual constitutional conference, which is free and open to the public is titled "The Constitution and the Police: Crime Control and Individual Rights." It is co-sponsored by the law school and the St. Louis chapter of the American Jewish Congress.

Dorsey D. Ellis Jr., U.S. attorney, dean and professor at the law school, will welcome the group, along with Leonard Frankel, president of the St. Louis chapter of the American Jewish Congress.

Among the 16 participating organizations is the Student Bar Association at Washington's law school.

As part of the program, Stephen J. Schulhoff, Frank and Bernice J. Greenberg Professor of Law at the University of Chicago Law School, will deliver the Jerome W. Sidel Memorial Lecture. Schulhoff also is director of the Center for Studies in Criminal Justice at the University of Chicago.

Richard B. Kuhns, S.J., professor of law at Washington, will serve as a panelist after the lecture.

The other panelists are: Judge Theodore C. McMillan of the U.S. Circuit Court of Appeals, St. Louis Circuit; James P. Damos, chief of police in University City, Mo.; James F. Gallen, student and faculty advisor in the urban sociology and director of public policy studies at the St. Louis University; Roger L. Goldman, a law professor at the University of Missouri; and Robert T. Haar, an attorney with Kohn, Shands, Elbert, Gianoulakis, & Gilman.

For more information, call Margaret Blinsky at 993-5505.

Panick attack study needs volunteers

Investigators at Washington University's Medical Center are seeking volunteers for a study involving panic disorder.

The condition characterized by anxiety attacks — the sudden onset of fear with such physical symptoms as heart palpitations, sweating, tingling in hands and feet, and others — lasting from a few minutes up to an hour.

This team of scientists from the departments of psychiatry, neurology and psychology was inspired by the American Psychiatric Association's publication of a physical abnormality in the brains of panic disorder patients.

Participants included in this eight-week outpatient program will be studied at Mallinckrodt Institute of Radiology, which has brain imaging technique permission emission tomography (PET) grant, before and after treatment with an anti-panic medication.

There is no charge for participation in this study.

Panick attack patients are encouraged to consider participating in this study. Call 562-254-3 for more information.

Calendar Deadline

The deadline to submit items for the Oct. 8-15 calendar of the Washington University Record is Sept. 26. Items should include name, title, date, place, nature of event, sponsor and admission cost. Incomplete items will not be printed. If available, include speaker's name and identification and the title of the event.

Also include your name and telephone number. Address items to King McHlrov, calendar editor. Box 1070.