

WPI transformations

WINTER 2005

A JOURNAL OF PEOPLE AND CHANGE

A collage of scientific and artistic objects. In the center, a microscope stands on a wooden surface. To its left, a beaker with blue liquid sits on a shelf. Above it, a lightbulb is visible. To the right, a tall graduated cylinder with blue liquid is prominent. In the foreground, a pair of glasses and a crystal are scattered. The background features a wooden cabinet with various items, including a small portrait and a decorative object.

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Technological Mind

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Starting Point

"The calling of the humanities is to make us truly human in the best sense of the word."

—J. Irwin Miller (1909–2004)

American industrialist, philanthropist, and activist

Before I came to WPI in August as the new editor of *Transformations*, math, science, and engineering were somewhat foreign to me. My love of writing and piano playing led me to study journalism and music in college. After graduation, I worked as a journalist at a daily newspaper in Connecticut before I landed at Buckingham Browne & Nichols School in Cambridge—an independent day school—where I oversaw the production of multiple publications, including its alumni magazine.

Given this background, I was both curious and anxious to see what it would be like to work at a polytechnic university. How would my liberal arts background mesh with a school known for science and engineering?

But I soon realized there was more to WPI than just science and engineering. For one, our students not only learn the mechanics behind a certain technology, but, through their projects, they see how that technology will affect people and society. In essence, they learn about the human side of technology.

True, most students come to WPI to study science and engineering. But it is the university's hope that they leave here with a breadth of knowledge that goes beyond the technological. More and more, students are seeing the advantage of having a foundation in the humanities and arts, in addition to their science-based curriculum. In 2005 alone, the number of double majors—where one of the majors is in humanities—increased twofold, says Patrick Quinn, HUA department head (See page 21).

In fact, the idea that to be a twenty-first century engineer, technologist, scientist, and the like, one must be knowledgeable and educated in both the sciences and the humanities is the driving force for some exciting changes at WPI. Already, many programs integrate the two disciplines, the newest of which is the Interactive Media and Game Development major, which weaves technology with art, math with storytelling. Still, the university is looking at how it can do more.

As a newcomer, I thought humanities and arts at a technological university sounded like an oxymoron, but I have come to eat my words. It is very much the opposite at WPI. Stop in at a rehearsal of any of the eight musical ensembles, or watch a theatrical production, or sign up for studio art, and you will see that the creative arts are alive and well at WPI.

The alumni, faculty, and students featured in this issue typify the relationship between creativity and the technological mind. Erica Tworog-Dube '00 and Don Lathrop '56 speak about how their foundations in science and humanities have shaped their careers as a genetic counselor and a college professor, respectively. And Stephanie Wojcik '04 says, "Arts and humanities shaped our culture... but science and technology are what make it run."

There's more. We check in with music professor Fred Bianchi, whose virtual orchestra brings together music and technology. Philosophy professor Roger Gottlieb talks about, among other topics, the role of philosophy at a technological college. Playwright Catherine Darenbourg '02, who, as a freshman, intended to become a mechanical engineer, tells how she found refuge in WPI's theatre after being diagnosed with schizoaffective disorder. And in our latest department addition—Entrepreneurship—Mick Darling '99 talks about his new venture, BioStrut, which is revolutionizing the way tissue scaffolds are made.

I hope you enjoy reading this issue. I welcome your thoughts, opinions, comments, and questions.

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Letters

On the mark

I enjoy reading every issue of *Transformations*, but this one [Summer 2005] was dynamite! It was even ahead of the stories on hurricanes Katrina and Rita, with headlines about gasoline prices going over the \$5-per-gallon roof. The subject of sustainable and/or renewable energy is being discussed daily in our secondary school science classes. I plan to pass my copy on to my grandson, who just entered Thomas Jefferson High School of Science and Mathematics in Fairfax County, Va.

Willard J. "Gadge" Adams '47
Rockville, Md.

Wind cannot stand alone

Congratulations on addressing the important topic of sustainable energy. Even before the tragedy in Louisiana and the Gulf of Mexico interrupted supply lines for oil, the need for a federal energy policy that recognizes renewable energy forms existed. However, in "Wind Power" [Summer 2005], Paul Gaynor '87 states that wind "is the only part of the power industry that has any real growth potential for the coming decades." This is inaccurate. In a recent column devoted to solar energy, the *New York Times* predicted a 35 percent yearly growth rate for the solar market. Few homeowners have the desire or ability to erect a 50-foot wind tower in their backyards, but they may install solar panels on their roofs. Likewise, wind technology does not just apply to automobile power, which accounts for more than half of fossil fuel use. Bio-diesel fuels and hydrogen cell technology will likely evolve to resolve some or all of that demand.

A universal source of clean power is, as yet, undiscovered. A portfolio approach that includes wind, solar, bio-diesel, hydrogen cells, and even nuclear power is more appropriate. In developing such a portfolio, alliances must be formed among the alternative energy stakeholders to influence public policy and minimize the power of large oil companies.

Our society and our political leaders must awaken to the reality that a balanced energy plan is the only means of succeeding in matching our growth and development aspirations with the fragility of our environment and the instability of world politics. When we acknowledge the role that wind, solar, hydrogen, and other energy sources play in satisfying our needs, we are in the best position to reduce our dependence on resource-depleting energy. When wind industries battle with solar, who wins? Oil.

Edwin Rule '05 (M.S. MTI)
Reading, Mass.

Future projects lead to future technologies

Your summer issue of *Transformations* was excellent. What was catching was the theme of writing about current choices and future technologies. What was more catching (and prideful) was that all the current choices you wrote about were done by WPI grads. It is the "future technologies" that interest me greatly.

To me, the WPI Plan with its interactive projects was the greatest step forward in education and for WPI. The proof of the pudding is that the program is getting stronger all the time. In this issue, I counted seven very different energy concepts. Knowing that at least a couple of them were literal takeoffs of interactive projects, my suspicion is that all of them were triggered from the experience of students, which, in turn, produced the creativity.

Otto Wahlrab '54
Hilton Head, S.C.

Completing the record on sustainable energy

I commend you on the timely choice of focus in the Summer 2005 issue on sustainable energy and want to mention another energy source, water power, in which WPI has made contributions for more than a century, and continues to do so today.

George Ira Alden, one of the first five instructors at the Worcester County Free Institute of Industrial Science (now WPI), designed and manufactured the Alden Dynamometer, which was used extensively to measure the power output of hydraulic turbines at the turn of the last century. He was largely responsible for the establishment of WPI's Alden Hydraulic Laboratory (1893) in Holden, Mass., and directed its operations, assisted by Charles M. Allen, Class of 1894. "C. M." invented the salt velocity method of measuring penstock water flow rate, which, coupled with the power measurements of Alden's dynamometer, enabled determination of turbine efficiency.

Such measurements were critical to the satisfaction of contractual guarantees provided by manufacturers and to the

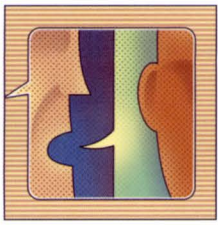
(continued on page 47)

Write to us

We welcome your letters. Please include your full name, year of graduation, and current address. The editor reserves the right to determine the suitability of letters for publication and to edit them for accuracy and length. We regret that not all letters can be published.

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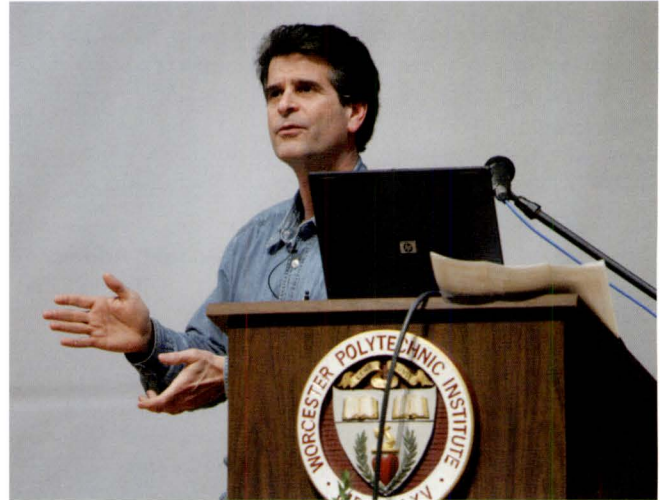
University Lecture

Physicist, inventor, and entrepreneur Dean Kamen '73 delivered WPI's first University Lecture on Nov. 3 before a crowd of 550 in Alden Memorial. The annual lecture, sponsored by the Office of the President, was established to bring to WPI speakers of national and international importance to enhance scholarly and scientific learning and stimulate intellectual exchange within the university and Worcester communities.

Kamen spoke about his latest project—a device that brings clean drinking water and electricity to communities who have no such access—which could save lives, one village at a time. Worldwide, more than 1 billion people have no access to clean water. And in the developing world, waterborne pathogens are the number one cause of disease. "It seemed to me it would be the right thing to do," the social entrepreneur said of his devices.

Kamen has dedicated his life to developing technologies that help people lead better lives. He holds more than 200 U.S. and foreign patents, many of them for innovative medical devices that have expanded the frontiers of health care. While still an undergraduate at WPI, he invented the first wearable drug infusion pump. He founded DEKA Research & Development Corporation to develop his inventions and provide R&D for major corporate clients.

Three of DEKA's notable breakthroughs are the HomeChoice portable dialysis machine, the Independence iBOT 3000 Mobility System, and the Segway Human Transporter.



Among Kamen's proudest accomplishments is founding FIRST (For Inspiration and Recognition of Science and Technology) in 1989. The organization is dedicated to motivating the next generation to understand, use, and enjoy science and technology.

Kamen has received numerous awards and accolades, including the National Medal of Technology in 2000 and the Lemelson-MIT Prize for Invention and Innovation in 2002. He was inducted into the National Inventors Hall of Fame in May 2005.

Signs of the Times



Above: New street pole banners bring greater visibility to WPI.

Right: Construction of The Bartlett Center, future home to admissions and financial aid, continues to progress. The building, made possible by a donation by James L. Bartlett Jr. '39 and his wife, Shirley, is scheduled to open in May.



WPI Links with UK University to Develop Areas of Mutual Interest

In October, President Dennis Berkey participated in a leadership exchange sponsored by the Cambridge-MIT Institute. The exchange, which brought together nearly 30 senior leaders from business, government, and academia, sought to establish ways in which regional civic leaders could help foster corridors of innovation, such as the technology corridors between Boston/Cambridge and Worcester in Massachusetts, and between Cambridge and Ipswich in the East of England. The U.S. delegation included Berkey, Worcester city manager Michael O'Brien, University of Massachusetts president Jack Wilson, entrepreneurs, and business and civic leaders.

As part of the exchange, WPI announced an in-principle agreement with the new University Campus Suffolk to develop areas of mutual interest, such as faculty and student exchanges, a project center, distance learning, and research, with a special interest in entrepreneurial programs.

Berkey made a return visit to England on October 25 to speak at the National Competitiveness Summit, in Manchester, on the university's role in regional economic development. "It is an honor for WPI and for me to be able to participate in these important discussions, which are of great value to WPI and to the Worcester region," Berkey said. "The UK is recognizing both the importance of developing a better educated labor force and the many reasons to foster the economic



From left: Berkey, James Hehir, of the Ipswich (UK) Borough Council, and Worcester City Manager Michael O'Brien.

development of its smaller cities. We can help in many ways and, in the process, learn how better to promote the development of our own region."

Integral to the exchange is WPI's expertise in regional development, entrepreneurship, and innovation, as well as science, technology, and engineering education and research. WPI and Worcester are building strong momentum with new projects such as Gateway Park, for research in life sciences, and WPI's Bioengineering Institute, which is conducting leading-edge biomedical research and creating innovative technologies for commercialization. Entrepreneurship is another strong emphasis at WPI, as evidenced by the work of the WPI Venture Forum and the Collaborative for Entrepreneurship and Innovation.

An initiative of the Cambridge-MIT Institute, the transatlantic leadership exchange first met in April 2005 at WPI.

WPI Venture Forum
Dinner with Entrepreneurs
CEI@WPI ALL-OUT Business Plan Challenge
Robert H. Grant Invention Awards
Strage Innovation Awards
Networking Events
Spotlight on Entrepreneurs
Elevator Pitch Clinics
CEO East Collegiate Entrepreneurship Conference
42 Workshops and 4 Interactive Seminars
Invention to Venture
Weekly Radio Program
Vantage Newsletter
Resources, vast networks, and much more



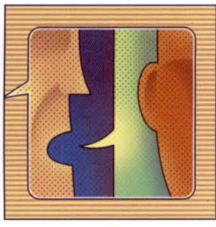
An entrepreneurial mindset

WPI takes entrepreneurship education seriously.

Just how much more seriously is up to you.

Our students are saying great things about WPI's new entrepreneurship programs. But, they want more. To innovate the future of business. You can help them attain the entrepreneurial mindset they need by working with the Collaborative for Entrepreneurship & Innovation in its Entrepreneurial Mindset Initiative.

For information call 508-831-5761 or visit www.wpi.edu/+CEI



Welcome to WPI

This fall, four senior administrators joined WPI: Richard F. Connolly Jr., trustee; Jeffrey S. Solomon, vice president for finance and operations; Christopher J. Hardwick, vice president for marketing and communications; and Cheryl A. Martunas, director of public safety and chief of police.

Richard F. Connolly Jr., senior vice president/investments at UBS Financial, brings to the Board of Trustees a strong business and management background, chiefly in the financial services industry. He became a financial advisor at Paine Webber (now UBS Financial) in 1973 and has been its top-producing broker for more than 20 years.



Additionally, Connolly has been a driving force within the Francis Ouimet Scholarship Fund, which provides need-based scholarships to students who demonstrate a strong work ethic by completing at least two

years of service to golf. Connolly, who began golfing and caddying at the age of 9, became a Ouimet Scholar while at Malden Catholic High School. He used the scholarship to attend the College of the Holy Cross, where he earned his B.A. In 2000, he established the Richard F. Connolly Jr. Distinguished Service Award through the fund. He is a former president and trustee of the fund, and has served as chairman of the Ouimet Memorial Tournament, and underwriter for the tournament's Richard F. Connolly Sr. Trophy. He has endowed a Ouimet Scholarship in his family's name.

Connolly serves as a board member or trustee to a number of institutions and organizations, including the Children's Medical Research Foundation in Dublin, the Ireland Chamber of Commerce in the United States, which he founded, and The Fenn School in Concord, Mass. He resides in Concord with his wife and three sons.

Before joining WPI in October, **Jeffrey S. Solomon** served at Brandeis University in several capacities, including vice president, chief investment officer, chief risk officer, and university treasurer. Prior to Brandeis, he was an audit manager at Coopers & Lybrand.



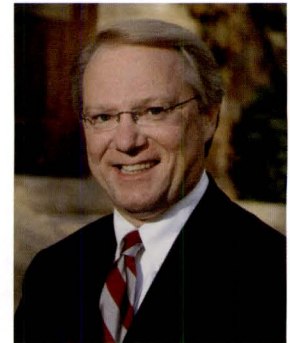
At WPI, Solomon is responsible for the university's financial functions, including accounting, treasury, investment, budgeting, and audit. He oversees the annual operating budget and the endowment, serves as treasurer of the WPI

Corporation, and has operating responsibility for the Physical Plant, Human Resources, Events Planning, and Administrative Services departments.

Solomon earned a B.S. in accountancy at Bentley College and an M.S. in management in human services at Brandeis.

Christopher J. Hardwick has 25 years' experience in building integrated marketing and communications strategies for institutions in the education, business services, health care, and financial services sectors. At the Wharton School of the University of Pennsylvania, where he served as director of communications and public affairs, Hardwick developed and led a multiyear positioning initiative and global communications strategy that resulted in achieving the top rankings among business schools for six consecutive years in such publications as *Business Week*, *U.S. News & World Report*, and *Financial Times*. He also crafted the internal and external communications in support of Wharton's successful five-year, \$500M Campaign for Sustained Leadership. He has led integrated communications programs for *Fortune* 500 companies, including Aramark Corporation and the CIT Group Inc.

Hardwick earned a B.A. in journalism at the University of Wisconsin and an M.A. in journalism/communications at the University of Maryland, College Park.



Cheryl A. Martunas is a strong advocate of community policing. She has 23 years of law enforcement experience, including 19 years in a campus setting. After serving the past eight and a half years as director of public safety and chief of police at Quinsigamond Community College in Worcester, this new post is something of a homecoming for Martunas. She began her career as an officer and sergeant with the WPI Campus Police Department in 1982.

Martunas holds a bachelor's degree in criminal justice from Anna Maria College. She is a member of the Statewide Anti-Terrorism Task Force, the Massachusetts Association of Campus Law Enforcement Administrators, the Greater Boston Police Council, the Massachusetts Police Association, and the Fraternal Order of Police.



Flying High

Nearly 30 students (right, with employees from Pratt and Whitney) will work on their major projects at Pratt & Whitney this year. Following a short hiatus, the collaboration between WPI and Pratt & Whitney has been re-established, thanks to the efforts of Michael Gonsor '86, Justin Urban '98, Robert Grelotti '98, Ryan Walsh '00, Dick Fair '78, and Kimberly Sullivan '92. In 1996, Professor Richard Sisson, head of the Materials Science and Engineering Program, developed research programs at the Learning Factory, a project center at United Technologies (Pratt's parent company) in East Hartford, Conn. Previous student projects include developing a computer model that can predict how thermal barrier coating systems will be applied to turbine blades, improving the way blades are held during grinding, and devising better methods for holding the blade to improve management databases. (See "The Jet Set," *Transformations*, Spring 2003.)



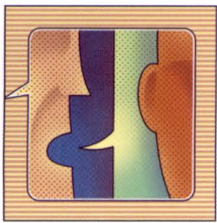
Inspiring a lifetime of learning
in math, science, and engineering



WPI's K-12 Outreach Program

is challenging students to grow academically and is making a difference in educating the next generation of technological humanists.

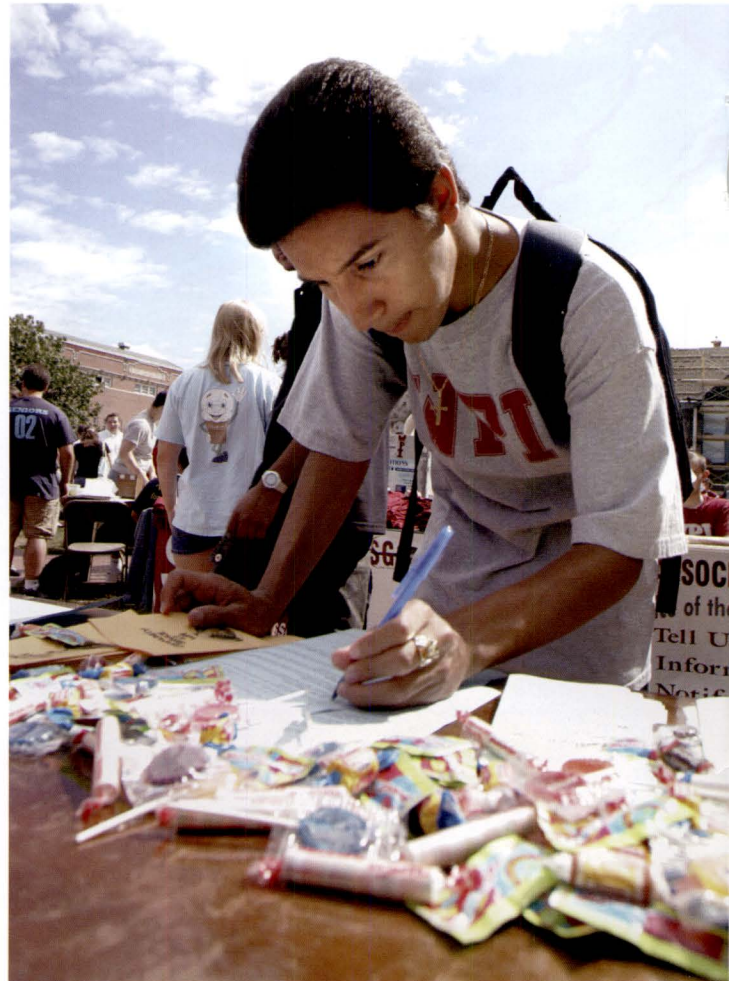
www.wpi.edu/Admin/K12



Homecoming, which was held the last weekend in September, attracts young families back to campus for alumni to reconnect with friends, faculty, and their alma mater.



WPI families join a recognizable face at **Parents Weekend**, Sept. 23–25.



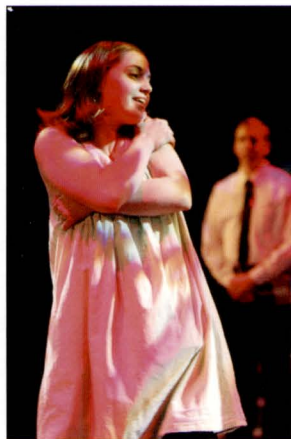
Meet the Class of 2009

- 735 freshmen
- average GPA: 3.6
- average combined SAT score: 1281
- average class rank: top 14 percent
- 31 states represented
- 51 international students from 27 countries
- top intended majors: computer science, mechanical engineering, electrical engineering

A big idea opens at WPI

In 1981, when she joined WPI as professor of drama/theatre, Susan Vick realized her first challenge would be finding a suitable venue for staging theatrical works. With its cavernous main hall and traditional proscenium-arch stage, Alden Memorial seemed ill-suited to the intimate theatre experience she hoped to offer the university community.

The solution was to design and construct, for each production, a theatre within a theatre, building not just sets, but platforms and seating areas engineered to bring the audience and the players into close proximity. The idea worked remarkably well, but took time and energy away from the real work of staging plays.



In November, theatre at WPI entered a new era as the university's first dedicated theatre facility, the Little Theatre, opened with a production of two new plays: *In Bad Taste* by Dean O'Donnell, instructor in WPI's Interactive Media and Game Development program (formerly administrator and instructor of drama/theatre), and *Prime Time Crime: Teal Version* by Catherine Darensbourg '02, who has written 15 plays for the WPI stage, two of which have gone on to Off-Off-Broadway productions (see page 35).

The Little Theatre began as a notion that struck Vick one day as she peeked into vacant space in the rear of Sanford Riley Hall. Looking beyond the falling ceiling tiles and general decay, she imagined a simple, yet flexible theatrical workshop. With a \$400,000 grant from the George I. Alden Trust, the vision became real as the space was transformed into a 99-seat black box theatre with a permanent lighting grid and sound system, a control booth, and a greenroom.

"It is my hope that the Little Theatre will be a valuable resource for the greater Worcester community, as well as for the WPI family, to enjoy," says President Dennis Berkey.

With a place to call its own, WPI's theatre program will continue to evolve and innovate, as it has since 1911. Today, *Masque*, *M.W. Repertory Company*, *Sunburns Theatre* (summer theatre), and *Student Comedy Productions* (improvisational comedy troupes) bring to the WPI community about eight productions a year. Since 1996, when Vick and O'Donnell founded WPI's Theatre and Technology Program, a number of those shows have included virtual reality and other cutting-edge technologies on stage.

While theatre has long been a presence in student life, it wasn't until Vick's arrival that it blossomed into a cultural phenomenon



Photos by Dan Vaillancourt

Left: a scene from *In Bad Taste*. Above: the casts from both plays take their bows on opening night.

on campus. An accomplished playwright, actress, and director, Vick has been a pied piper of the boards, engaging students through her courses in drama and stagecraft, leading many deeper into the world of the dramatic arts as an advisor to student projects, working closely with students who choose to major or double major in theatre (the most popular concentration area in Humanities and Arts), and providing frequent opportunities for students to put theatrical theory into practice and showcase their talents and work. Her efforts were recognized in 1997 with the WPI Trustees' Award for Outstanding Teaching.

The biggest annual WPI theatre presentation is *New Voices*, a festival of new plays written by members of the WPI community that Vick launched in 1982. Defying the skeptics who said science and engineering students couldn't write great plays, the festival brings more than 20 productions to the stage each spring, involving more than 200 students as cast, crew, and staff.

Many students who get turned on to theatre on campus remain active in WPI theatre as alumni. Some use their theatre experience as a stepping stone to graduate study and careers in the field. Among them is Jessica Sands '98, a computer science major who recently joined the WPI faculty as an adjunct instructor of drama.

One day in September, Sands, Vick, and theatre major Amanda Jean Nowack '06 stood in the nearly finished Little Theatre, looking around and laughing like kids who had just received the best birthday present ever. "Three women of different generations stood in the middle of our own, hard won, dedicated space, and we all said, 'We can work with this,'" Vick says. "And then, we rolled up our sleeves and got busy."

—Michael W. Dorsey

Inside Inside WPI



A Jolly Good Feller...

Sam Feller '07 is the recipient of a prestigious Department of Homeland Security Scholarship—a two-year, full-tuition award that includes a generous stipend and an internship at DHS next summer. Intended for students studying science and technology, only 10 percent of those who applied nationwide received awards in 2004.

As part of the application process, Feller wrote an essay explaining what he could do for the Department of Homeland Security. But his answer, really, can be applied to all aspects of his life: "It's not a question of what I *can* do, it's what I *want* to do."

And what he wants to do—whether during his internship next summer or after graduation from WPI—is research and development. "I have always been interested in high-end defense work," he says.

Since high school, Feller has been accruing an impressive list of accomplishments. As a senior at Thomas Jefferson High School for Science and Technology in Alexandria, Va., he developed a prototype of a lacrosse stick. An avid fan who has played goalie since the eighth grade (and continues to play at WPI), he created a goalie stick made of carbon fiber.

"The lacrosse stick was something original that no other company had on the market," he says, adding that he has since turned his attention to other lacrosse-related inventions. He won't divulge specifics because he hopes to obtain patents for his ideas in the near future.

Feller says he chose to come to WPI because of its project-enriched curriculum, but since arriving on campus he has also become involved in the university's diverse extracurricular activities. As a freshman, he joined the Ballroom Dancing Club, though he had to stop last year when practice sessions conflicted with lacrosse. He also is active with his fraternity, Tau Kappa Epsilon.

"The fraternity is the first place where most of us have had real responsibility," says the TKE brother. "But it's the best place to learn because your friends are there to help and support you."



And Life By Rachel Faugno



Patrick O'Connor

Grounded *in the Arts*

The arts have always been important to Stefanie E. Wojcik '04. She began studying piano at age 4 and still plays daily for personal enjoyment. Her humanities work at WPI culminated in a recital featuring works by Chopin, Mozart, and Brahms. Her IQP with the Worcester Community Project Center focused on ways to convert vacant mills into suitable housing and studio space for Worcester artists.

Now a graduate research assistant in mechanical engineering with plans to explore a career in industry, Wojcik expresses a deep appreciation of the value of the arts and humanities in her education. "Arts and humanities are especially important at a technological school like WPI, where the core courses are very intense and students are extremely focused," says Wojcik, whose B.S. is in physics. "Music, literature, and history help you relax and at the same time challenge you to look at your work from a broader perspective."

Professor William W. Durgin, with whom Wojcik is conducting research on the transmission of sound over long distances in the ocean, observes, "Being grounded in the arts and having a broad perspective flows over into research work. There is more to research than technical curiosity; there is also the heightened sense of need to contribute to human progress in a responsible way. I think WPI does a better job than many other universities of fostering an appreciation of the greater implications of science and technology."

Speaking at WPI's new faculty orientation this fall, Wojcik said that because WPI is so flexible, there is no one typical way of doing something, no one typical student. "Projects are a great influence on every student's academic career," she explained, "because they allow you to think creatively and independently." She says that humanities projects, in particular, allow students to see the world in a new light and give them a better appreciation of the richness of our culture.

With humanities projects, students explore areas of interest that may have no direct bearing on their career goals. Her own project centered on her piano performance, but her interest in the arts led to an IQP reaching out to Worcester artists.

Working with Eric Anderson '04 and Conor Casey '05, and under the direction of David DiBiasio, professor of chemical engineering, and Steven Taylor, assistant professor of management, Wojcik's team conducted a survey intended to help Worcester create a successful artists district, an idea the city has been exploring for some time. The Artist Survey Project—developed by Rob Krueger, Worcester Community Project Center director—was disseminated in a three-phase process by three separate teams. It asked artists about their preferences in living and studio accommodations, and sought to identify the types of amenities that would attract them to an artists district.

"I was amazed by all the creativity in Worcester," says Wojcik. "I could spend a whole day going to all the arts places and a whole week going to all the arts-related businesses. There are enough artists to create a vibrant district, but there has to be careful planning in order to attract them. Our survey looked at the need for studios, galleries, living space, and amenities such as electricity and sinks."

Survey results, which were well received by the city, identified a number of artists interested in living and working in what are currently brown spaces. The information will serve as a useful guide for economic planning and development, says Krueger, noting that converting old mills into modern accommodations will require a sizeable investment of resources. "Technology in service of the arts," he explains.

But, as Wojcik sees it, the arts and technology have always gone hand-in-hand. "Arts and humanities shaped our culture. It's who we are," she says. "But science and technology are what make it run."



Two Degrees of Separation

For those with muscular dystrophy, a device—developed as a student project—gives users the two degrees of freedom they need to perform everyday tasks.

Since 1989, Allen Hoffman, professor of mechanical engineering, has worked with the Massachusetts Hospital School, in Canton, Mass., on rehabilitation projects that encourage his students to see how their skills can actually help people.

From that relationship came a recommendation by Gary Rabideau, director of rehabilitation engineering at the hospital, to create a device that helps people suffering from muscular dystrophy perform simple, everyday tasks with their hands.

The result: a prototype of a wearable powered arm-orthosis that restores arm function. Now, after working with several student teams on this project, Hoffman says the device could be ready for patenting and licensing in two years.

“We’re starting to look at how it could be used by people and to see how we can refine it,” Hoffman says. “It could have quite an impact. We’re still in the development stage, but we feel it’s a usable device. Right now, these people need assistance in all these activities. This device would allow them to do a number of activities independently.”

Typically, Hoffman’s students do such work as part of their Major Qualifying Projects in their senior year. Mechanical engineering students Steven P. Toddes ’05, Michael J. Scarsella ’05, and Daniel N. Abramovich ’05 worked with Hoffman last year. Toddes and Scarsella, now ME graduate students, have continued their work with Hoffman this year. Scarsella says the project took on a sense of importance after he met a boy with muscular dystrophy at the hospital school.

“We were there mainly to ask his opinion on the project,” he says, “but when he started telling us how all he wanted was his independence back, and to be able to perform the tasks of daily living he was used to, it really made us all emotional, and more motivated than ever to succeed.”

Scarsella also enjoys the complexity of the project. “The intermeshing of biomechanics, electromechanical components, arm kinematics, manufacturing, and the human aspect, needs to be kept in mind throughout the duration of the project.”

Rabideau says that of the 90 residents at the hospital, including 35 patients in the day program, a dozen have muscular dystrophy. He says it’s frustrating for them to retain dexterity in their hands while being hindered by muscle wasting in the shoulders, upper arms, and trunk.

“They can’t place a hand where it needs to be to do an activity,” he says. “These are bright guys, very creative, but they’re trapped in their bodies. They can’t run a computer or feed themselves, but they can grasp, pinch, and touch. That’s a real frustration to them—there are so many things they want to do, but they just can’t.”

Rabideau, who has a master’s degree in rehabilitation engineering, explains that the powered arm is designed to allow the hands to move through space, not just across the lap tray. He says this approach goes beyond traditional engineering education.

“I think at times there’s a real disconnect between the theory taught in the classroom and its application in terms of seeing the result—especially on people,” he says. “This (device) makes a dramatic difference in people’s lives, beyond entertainment, beyond luxury.”

The most common of the nine types of muscular dystrophy is DMD (Duchenne muscular dystrophy), a degenerative disease that primarily affects males and is passed down through their mothers, according to the national Muscular Dystrophy Association. Victims lack dystrophin, a protein that helps keep muscle cells intact. The onset of the disease is between 2 to 6 years of age, when children generally experience weakness and muscle wasting in the hips, pelvic areas, thighs, and shoulders, and have trouble walking.



Patrick O'Connor



Patrick O'Connor

By the time they're 10 to 12, they're bound to a manual wheelchair, and by their teens, they're forced to live in an electric wheelchair. Survival is rare past the 20s—DMD affects all the voluntary muscles, including breathing muscles.

Initially, the disease affects the proximal muscles (the muscles closest to the body), but spares the distal muscles (those farthest away from the body), so teenage sufferers can still move their hands. The problem at this stage is they can't position their hands in a useful manner and instead rest them on their laps or on their lap trays. To compensate, they walk their fingers across the tray to the objects they want to grasp.

The solution for Hoffman and his students was to develop a motor-powered brace that fits over the user's arm and allows him to flex his elbow and rotate the forearm by operating a joystick with his free hand. The lap tray is used as a horizontal pivot point, giving the user two degrees of freedom.

Powered by an electric mechanism, the brace is designed to move an additional three-pound load at the location of the hand, allowing the individual to grip objects, such as a toothbrush or utensils for eating.

The powered arm-orthosis has gone through several changes. At first it was mounted to a wheelchair, but its use was awkward. It also started out with four degrees of freedom—it allowed for an additional two shoulder motions—but that proved to be too complicated.

The remaining challenges for Hoffman and his students are to reduce the weight, simplify the controls, improve the aesthetics, and, finally, test it on someone who actually needs it. "Inevitably, there will be suggestions for improvements," Hoffman said.

Rabideau says that in his last 15 years at the hospital, he has seen improvements to electronics in wheelchair use, but nothing like what this device would do.

"What I really like about it is that it actually helps these kids use their own hand instead of a robotic-controlled arm," Rabideau says. "I think it keeps them connected. It's more therapeutic, more gratifying."

Seated: Steven Toddes demonstrates the prototype of a powered arm-orthosis that he helped develop with, from left, Daniel Abramovich, Professor Allen Hoffman, and Michael Scarsella.





Explorations

By Joan Killough-Miller



Patrick O'Connor

London Projects Provide a Passport to the City's Cultural Treasures

Access can mean many things to many people. To a wheelchair user, it could mean viewing the upstairs chambers of Charles Dickens' London home. A jazz fan looking to hook up with the local music scene might never discover the city's smaller, unadvertised clubs without an insider's guide. Even a lack of Internet skills can be a real handicap to those devoted to preserving London's grand history and making it accessible to a twenty-first century audience.

Students at the London Project Center spent last spring and summer finding new ways to make the city's cultural treasures more approachable to more people. Drawing on unique research methods and technical expertise, students were able to enrich the experience of actual visitors and bring London's rich history and contemporary arts to those who cannot manage the trip.

"I call it the music and museums summer," says adjunct instructor of music John F. Delorey, who relished the opportunity to show students around the city where he did his graduate research. One of his students, Jamie Mitchell '07, focused his humanities and arts project on the city's jazz scene. Mitchell, a drummer and guitarist, began with this question: "Is there such a thing as 'London Jazz'? Or is it just that there is jazz in London?"

Hardly a subject for library research, the project had Mitchell out late at night, scoping out lesser-known clubs. He interviewed owners, audience members, and players, who took him to after-

hours jam sessions and introduced him to a network of freelance musicians. His research took him into areas not typically visited by tourists, where he found a diverse and thriving musical idiom, and a shared optimism that "jazz is on the up" in London. As an American, Mitchell gained entrée into this subculture as a respected "jazz ambassador," Delorey notes. ("We sort of borrowed your art, didn't we?" one Londoner remarked.)

Mitchell's project report included a historical overview and an analysis of stylistic and attitudinal differences between London and the United States, as well as transcripts of his interviews. Going beyond the typical humanities and arts project, Mitchell designed a map-linked database of jazz venues, modeled on destination city guides such as "Time Out." He included a rating system for music and food, performance schedules, nearby tube stations, and clear directions. "They gave him a lot in seven weeks," said Delorey. "I did almost nothing except read his work."

Beyond opera

Reaching back to the music of a bygone era, Delorey also advised an IQP team working with the Sir Arthur Sullivan Society. Sullivan (1842–1900) is best known for his collaboration with W. S. Gilbert on *The Pirates of Penzance* and other comic operettas, but this is only one facet of his life's work. "His work has huge historical significance,"



Drawing on unique research methods and technical expertise, students were able to bring London's rich history and contemporary arts to those who cannot manage the trip.

Delorey says. "It is light opera, yes, but of the highest quality. One hundred years later, you still can't dispute that." Delorey recently came into possession of a collection of Sullivan memorabilia, including complete scores, facsimiles, and concert programs. In addition to cataloging the collection for scholarly use, he would like to establish a tradition of musical theatre for WPI's orchestra and vocal groups.

When Delorey heard that the Sullivan Society wanted to enhance its Internet presence, he saw a wonderful opportunity to bring WPI's Web design talent into play. He describes the society's membership as British—including some nobles—but lacking in IT skills. Michael Kristan '07 and Christopher Sweeney '06 embarked on an IQP project to improve the focus and functionality of the society's Web site. More than just a facelift, their recommendations—which were resoundingly accepted by the society's Board of Directors—helped the nonprofit organization emphasize its academic stature and offer a higher level of services to members. Upgraded server capacity and modernized e-commerce technology were designed to make it easier to join the society, purchase goods, and collaborate with other scholars. The students left behind a complete manual for site upgrades and maintenance. They also added a new feature—a virtual walking tour, with street maps and directions for those who wish to take the actual tour on foot.

Access for all

At the Charles Dickens Museum, an IQP team advised by professors John Sanbonmatsu (philosophy) and Guillermo F. Salazar (civil engineering) joined forces on a very different challenge. The United Kingdom's Disability Discrimination Act of 1995 requires handicapped

access to public places. But major renovations to the author's former home could detract from the building's historical value, and even conflict with the museum's stated mission to "protect and preserve 48 Doughty Street...for the appreciation of the life and work of Charles Dickens." The 12-room home was saved from destruction in 1923 by the Dickens Fellowship. Its steep staircases and tight corridors make the usual accommodations—such as ramps and lifts—unfeasible, and it is doubtful that the structure could support an elevator.

Rather than bring handicapped visitors to the museum's inaccessible spaces, Carol Carveth '06, Matthew Densmore '06, Shawn Donovan '06, and Brenton Dwyer '06 created a virtual tour that brings the museum to them, combining text and panoramic photography to give an inside view of the building's major attractions. "I chose the project at the Dickens Museum because the results would make an impact right away," Dwyer says. "Hopefully, the virtual tour will give visitors a more complete experience."

Virtual visitors are free to choose their own path, or to follow a guided tour. Hyperlinks offer close-ups of objects of interest as well as links to further information and outside resources. The students also put together an online tutorial to help those new to the Web navigate the various features. In their research they used a visitor's survey and received feedback from representatives of disabled rights groups. The tour includes views of historic portraits and artifacts that influenced the author's life, such as the attic window he gazed through from his childhood bedroom, the study where he completed *The Pickwick Papers* and *Oliver Twist*, and an eerie door knocker that later haunted the dreams of Ebenezer Scrooge.

Web Links

Sir Arthur Sullivan Society:

www.sullivansociety.org.uk

Charles Dickens Museum-Virtual Tour:

www.dickensmuseum.com/vtour



Entrepreneurship

By Eileen McCluskey

5. Conclusion

- 1) The Precision Embedding System has been installed and described in integrated scaffold design and fabrication into the standard process. PC workbooks with designed and device release applications have been developed successfully.
- 2) The SEM imaging, MicroCT, and mechanical testing have been completed for the first time. The results are promising and will be used to optimize the scaffold design and fabrication process. The precision can allow experimental results ranging from the scaffold.
- 3) The results and manufacturing feasibility, however, indicate that the scaffold design is a good candidate for future engineering applications.

Center Stage on Medical Miracles

Patrick O'Connor

Mick Darling doesn't like doing the same thing twice. That's why he loved WPI.

Though Richard (Mick) Darling '99 started out as a physics major, his studies took a dramatic turn when he discovered New Voices, WPI's annual new plays festival, during his freshman year. "I love math and physics," he says, "but I wouldn't enjoy research. I need a lot of variety."

Through New Voices, Darling worked as stage hand, actor, producer, and director. "I loved the work. There was no repetition, because we did so many new shows," he says. "It's amazing that this technological university has such a great theatre program."

Now, six years after graduation, Darling is drawing upon his humanities degree and computer-aided design (CAD) experience to play a new starring role, this time as entrepreneur.

By capitalizing on his brother's invention of a new type of tissue scaffold, Darling and his team stand to make a name for themselves in the emerging field of tissue engineering.

Andrew Darling, a doctoral student at Drexel University, and his Ph.D. advisor, Wei Sun, assistant professor of mechanical engineering and mechanics at Drexel, created the scaffolds at Drexel's Computer-Aided Tissue Engineering (CATE) Laboratory. Tissue scaffolds—small, three-dimensional structures about half an inch long—are crucial in tissue engineering (TE), an emerging field in which researchers grow human tissues by placing living cells on scaffolds made of biodegradable polymer. TE could revolutionize organ transplants and enable such wonders as healing bones and repairing severely damaged skin.

“My time with WPI theatre taught me how to teach myself, so I’m ready to meet whatever challenges come along.”

Already, Darling’s group has been recognized for their work; they won third place in Drexel’s Business Plan Competition last spring.

“I knew Andrew was on to something when I heard who was calling for the scaffolds,” Darling says. The National Institute of Standards and Technology, for example, asked for 900 scaffolds to help the institute establish tissue engineering benchmarks. Other research centers, from Shanghai to San Antonio, also placed orders for the new product, which they saw as far superior to existing scaffolds.

The problem, however, was that CATE is a laboratory, not a factory. The existing machines needed retooling to meet mass production demands.

Enjoying this novel opportunity, Darling examined Drexel’s machinery. “I thought it would be simple to modify the manufacturing equipment,” he says with a modest shrug.

Andrew and Professor Sun agreed. Mick’s assessment showed that nearly everything they needed—from computers, to vibration prevention tables, to 3-D positioning equipment—is available off-the-shelf.

Too, the team’s mouthwatering market assessment showed several untapped areas for the manufacturing technology—a \$30.8 million annual research scaffold market, plus \$160 million per year for industrial biotech applications. Future clinical uses for tissue engineering are expected to be worth greater than \$350 billion annually.

Knowing they have the manufacturing edge, the team decided to move fast. They call their newly formed, dual companies BioStrut, after the strands, or struts, of bio-compatible polymer that form their waffle-like creations.

Mick Darling plays a bridging role as chief operating officer for both concerns. BioStrut LLC will do research and consulting on scaffold technologies. Andrew Darling is CEO, and Sun is chief technology officer. The other company, tentatively named BioStrut Inc., will manufacture the products. A new CEO will run this show.

BioStrut’s seemingly assured success lies in the fact that good scaffolds are hard to find. Most researchers have to create their own, with varying results that slow down their progress. Many rely on the process of seeding, with salt, a plastic-like molded form. The salt leeches through the material when water is added, creating random holes and robbing scientists of much-needed architectural control.

This control is critical, since cells have to migrate along specific paths through the scaffold to properly form tissue, whether heart, liver, or bone.

“BioStrut’s precision extrusion deposition process creates infinitely customizable tissue scaffolds,” says Darling. In manufacture, a small extrusion head and a 3-D positioning system deposit a strand of polymer one-tenth the width of a hair strand, which hardens as it cools. New layers are deposited one atop another, forming three-dimensional structures.

Keen on using their competitive edge to its fullest advantage, the BioStrut team is marching ahead. As early as the spring of 2006, researchers will be able to order their scaffolds online, choosing from among three or four standard configurations, or specifying custom jobs.

“The work I’m doing with BioStrut is plenty varied for me,” Darling says, smiling, “from the manufacturing to the marketing and sales of a cutting-edge product. I’m loving it, and I feel confident. My time with WPI theatre taught me how to teach myself, so I’m ready to meet whatever challenges come along.”



Getting Down to Business:

WPI’s Collaborative for Entrepreneurship & Innovation

Nationally, colleges and universities are experiencing an influx of students across the disciplines who are interested in taking entrepreneurship classes, says McRae Banks, director of the Collaborative for Entrepreneurship & Innovation (CEI).

And WPI is no different.

“At CEI, we find it challenging, and stimulating, to try to keep up with the demand for our programs,” Banks says. CEI has worked feverishly to respond to this demand—a commitment that recently won WPI placement among the nation’s top 10 entrepreneurship programs for 2005 by Entrepreneur.com.

CEI, housed in the university’s Department of Management, offers a variety of programs for the WPI community and beyond:

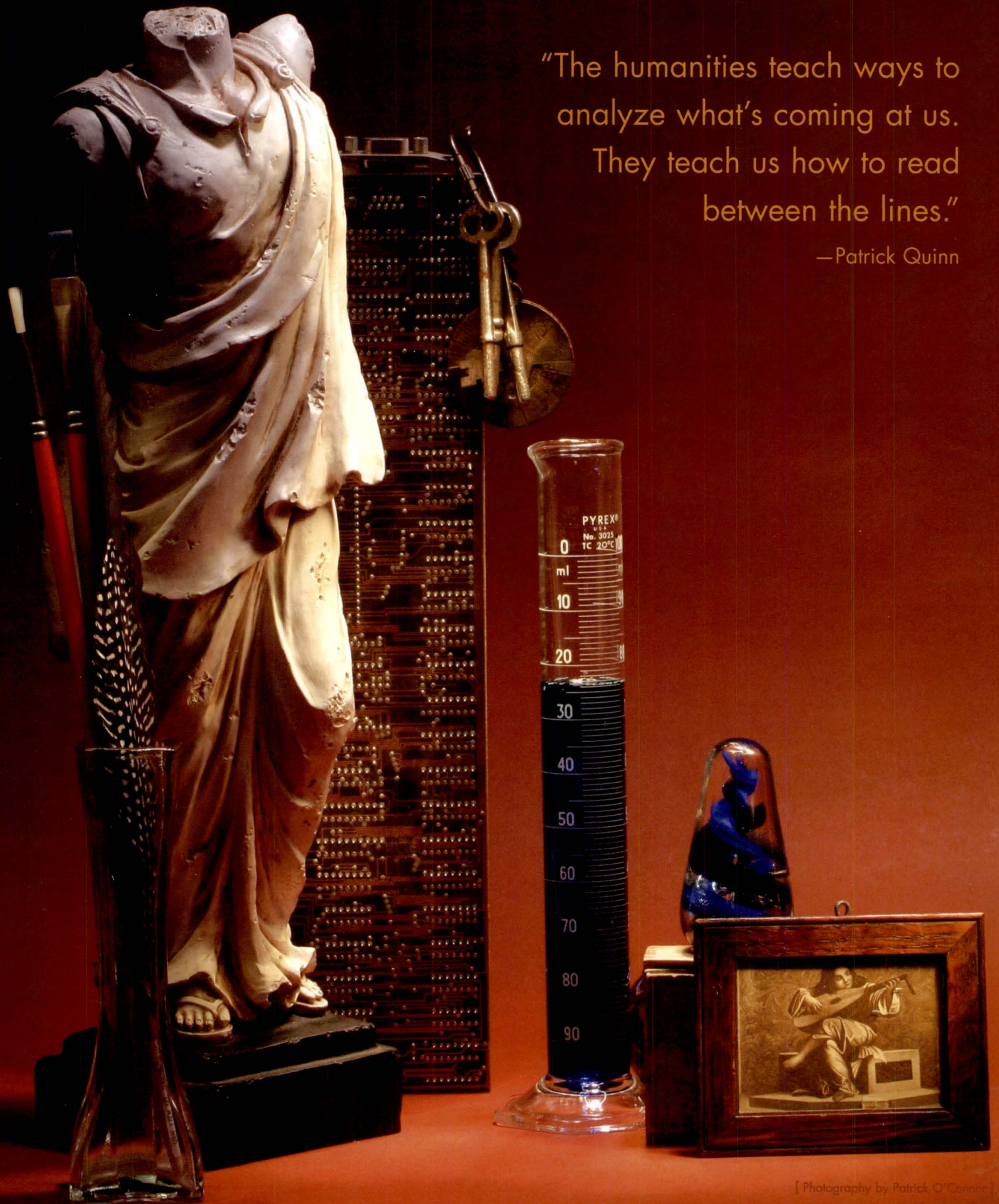
- **WPI Venture Forum**—provides monthly lectures, weekly radio programs, and networking events, in addition to other opportunities. For more information, go to www.wpiventureforum.org.
- **Dinner with Entrepreneurs**—offers students the opportunity to meet and speak with entrepreneurs and investors to learn from their successes and mistakes.
- **Invention to Venture**—a one-day workshop that brings in seasoned entrepreneurs who share their knowledge on how to assess the market validity and technical viability of business ideas. Speakers also offer their hard-earned knowledge on IP licensing, finding the money, and other critical issues for new businesses.
- **Competitions**—the Strage Innovation Awards, the Robert H. Grant Invention Awards, and the CEI @ WPI ALL-OUT Business Plan Challenge nurture the spirit of innovation at WPI and help young and aspiring entrepreneurs fulfill their inventive dreams.
- **The Writing Project**—WPI alumni entrepreneurs are interviewed to produce inspirational stories for others trying to launch businesses.

Attention Alumni Entrepreneurs and Business Leaders:

CEI is interested in hearing from you. Contact Gina Betti at gbetti@wpi.edu or 508-831-5761.

"The humanities teach ways to
analyze what's coming at us.
They teach us how to read
between the lines."

—Patrick Quinn



The Well-Rounded Technologist

Humanities and Arts at WPI

By Eileen McCluskey

When people think of WPI, they see a university offering some of the nation's best programs in cutting-edge engineering, science, and technological disciplines.

Less known, however, is that WPI also provides challenging and enlivening humanities courses, with a faculty that seeks to inspire in students a love of theatre, history, music, literature, philosophy, and other arts and humanities concentrations.

"WPI isn't about just churning out people who can crunch numbers, but developing people who can be creative within the bounds of their disciplines," says Sergio Salvatore '02CS, lead architect of mobile technology for Sony BMG Music Entertainment.

Now, the Humanities and Arts (HUA) Department, working with the full university faculty, is examining the possibility of expanding HUA staff, course offerings, and visibility on and off campus.

New growth potential

WPI President Dennis Berkey supports the cultivation of a curriculum rich in the humanities. "We're producing leaders, not just engineers and scientists," he says. "We're developing students who are thoughtful and well-informed about the ways in which the world works, who think deeply and seriously about issues related to the humanities and the arts as well as about technical, engineering, and science-related issues."

In fact, the university is looking at how the humanities and arts might be more fully integrated into WPI, through one of seven commissions formed last year at Berkey's request.

"The changes we'll make are not yet fully decided," says HUA department head Patrick Quinn. "But the process is progressing well."

Quinn sees many benefits to WPI in enlarging the role played at the university by the humanities. For starters, he thinks WPI could build a larger student body by expanding its HUA programs. "We've got this tremendous infrastructure. We could use it to bring more students to WPI," he says. "We know we need to grow the university's enrollment, and the humanities has plenty of room to do this by creating courses that build on our strengths."

One new program that seems to be attracting more students already is the four-year undergraduate major in interactive media and game development. Launched this fall, IMGD requires students to draw upon the humanities and arts through courses in storytelling and the social and ethical dimensions of interactive media. Quinn thinks the course could spawn other entertainment science courses, such as those in cinema production and interactive new media.

To be sure, existing courses and programs take advantage of both the humanities and the sciences and technology. (*See page 29 for more on music professor Frederick Bianchi's virtual orchestra; see page 9 for more on the new Little Theatre at WPI.*)

"We're already moving on our strengths in technical writing, theatre, music, and American and European studies," says Quinn. "We can do more to meld the social sciences and humanities. I think implementing broader programs would be great because students would leave here with this tremendous breadth of exposure across the sciences and humanities."





Dan Vaillancourt

“WPI isn’t about just churning out people who can crunch numbers, but developing people who can be creative within the bounds of their disciplines.”

— Sergio Salvatore '02

To study Shakespeare and Newton

By continuing to support the humanities curriculum, and by further integrating HUA programs with WPI’s signature technical and scientific degrees, Quinn hopes a new way of envisioning education will arise at WPI.

“Traditional liberal arts degrees are passé,” he says.

“Wouldn’t it be great, and make sense, to offer a degree program in what a person needs to know to be a full citizen of the world? To study not just Shakespeare, but also to understand the practical implications of Newton’s laws, to know how elasticity works, and how it is that computers can translate electrical signals into the entire collection of the Library of Congress. This kind of technical literacy is knowable, and we should all be educated in it.”

The same, says Quinn, goes for those whose proclivities inspire them to become engineers, scientists, and technicians. “What can the poets of World War I teach us about the experience of being a soldier in a war?” he asks, citing Siegfried Sassoon, who fought in that war and about whom Quinn has long studied and written. “Sassoon wrote poems about how war affects the soldier. If you’re building war machines, isn’t it important to think about the effects of the machines on the people who use them, and on whom they’re used? This is right in front of us. All we have to do is read, think, and discuss. Wouldn’t a degree that covers all of this be astounding?”

Such a bold, fresh vision for higher education is by no means being examined only at WPI. In fact, Quinn recently participated in a three-day conference sponsored by the National Science Foundation, at which two humanists and one social scientist discussed the future of liberal arts education with 15 scientists and the same number of engineers.

“It was fascinating. We asked ourselves and each other, ‘Why are the students at our great universities unaware of the problems in the world?’ These students have technical literacy but very little knowledge of the humanities,” says Quinn. “And we talked about how technologists are getting way ahead of themselves.”

He described how the scientists and humanists gathered at the conference agreed there is danger afoot “if scientists don’t have sufficient grounding in the humanities—that, for instance, people are at the mercy of propaganda if we don’t understand that’s what it is. The news, the written word, the arts, can easily be used to manipulate the masses if we aren’t grounded in the critical thinking skills the humanities offer. The humanities teach ways to analyze what’s coming at us. They teach us how to read between the lines.”

Carol Simpson, provost and senior vice president of WPI, notes, “There’s no doubt that humanities offerings broaden the students’ educational base so that they acquire a better understanding of the societal impact of their technical work, as well as critical thinking skills and the ability to express themselves well.”

While discussions continue on how WPI may change and expand its humanities and arts offerings—with decisions expected in 2006—Quinn feels his department is raring to go. “We’re blessed with a faculty that’s been very supportive of the changes that have already taken place, such as adding the interactive media major,” he says.

“As we market ourselves as a comprehensive university,” he continues, “we’ll attract more students who, like Ms. Servatius [Irma (Roberts) Servatius ’04, see next page], may start in technology but then see the humanities offerings and want both. As this continues, we’ll develop a more diverse student body, kids with an interest in history, music, theater, and writing.”

As he considers the possible outcomes of the strategy and review process under way at WPI, Quinn believes that faculty across departments will forge a strong future for the humanities and the arts. “The people here tend to be open to the importance of giving our students every opportunity to explore the humanities,” he says. “As a community, we understand the critical need to cultivate cultural and historical awareness. This is what a university is for: to keep open the free exchange of ideas. I think we’re at the beginning of an exciting new era here at WPI.” ■



Technically Speaking

Increasing numbers of WPI students recognize how important a liberal arts education is to them. In fact, more and more students are adding a humanities major to their technical, engineering, or scientific studies. "In 2005, we moved from 32 to 60-plus double majors," says Patrick Quinn, head of the Humanities and Arts Department.

Paul Messier '05ECE/HU, for one, feels grateful to WPI for giving him a chance to focus on his two favorite pursuits: theatre and engineering. "Both of my advisors—Susan Vick in theatre, and [professor of electrical and computer engineering] Alexander Emanuel—understood the importance of the humanities in a technical education," says the electrical engineer with BAE Systems in Nashua, N.H. "They also saw how important technical knowledge is in a humanities education. I felt a lot of support from them as I pursued my double major. They recognized that so much in life that is beautiful is expressed through the humanities."

Messier brought an interest in lighting design and technology with him to WPI, having worked in those capacities at the Spirit of Broadway Theater in Norwich, Conn., for four years prior to starting his undergraduate studies. Like Quinn, Messier sees the interconnectedness of science and the humanities. "I need to allow both my creative and my technical juices to flow freely," he says. "I think both are crucial in understanding our world."

Messier put that sentiment to work in every technical presentation he made at WPI, by using his theatre training to help him relate new ECE concepts to his colleagues. As he gave his talks, Messier focused as much on keeping his audience engaged as he did on the technical knowledge he needed to impart. "My humanities courses helped me bring something new to these presentations, whether it's how I used tone of voice, or images, or gestures to emphasize certain concepts," he says. "And I know that every time I have the opportunity to speak before my team here at BAE, I'll tap into those dramatic and public speaking skills."

Chad Whitney '99MIS/HU finds his writing abilities bring practical benefits in his work as lead program manager with Microsoft Windows Mobile Devices in Redmond, Wash. "I see the benefits of my dual major every day in my career," he says. "When I first started working here, I wrote design specs all day. No one would have known how to implement those designs if I couldn't articulate them clearly."

Now that he's been promoted to manager of his group, "I have to be very clear in my oral and e-mail communications, too," he says. "A lot of people throw grammar out the window in their e-mails. I don't, and I think it helps our work flow more smoothly. I certainly wouldn't

have come this far if I couldn't write clearly and communicate well."

On occasion, a WPI student will change course entirely, and follow a purely humanities path. **Natalie Cole '04/HU** started in mechanical engineering, but "I decided it wasn't for me." With the support of faculty advisors Laura Menides, professor of English (retired 2005), and assistant professor of English Michelle Ephraim, Cole designed her own concentration in creative writing. She's pursuing this passion further as a graduate student at Columbia University. "I think every school should offer a lot in the way of humanities and the arts," she says, "because that's what connects everybody. The humanities give everybody ways to communicate—not just transferring information, but connecting on a human level."

And then there are those students who enjoy it all. "WPI made it possible for me to pursue two different walks of life," says **Irma (Roberts) Servatius '04ECE/HU**, who discovered her aptitude for electrical engineering when she took a summer class with professor of practice Robert Labonté just before entering WPI. "I'd always heard girls aren't good at engineering. WPI gave me the confidence to say, 'That's not true.'"

Although Servatius had studied violin from an early age, in addition to math and science, she didn't think she should consider a musical career. "I thought it would be impossible to get anywhere in music," she says. But that was before administrator of applied music Douglas Weeks encouraged Servatius to try the viola. "I fell in love with it."

Once her passion for viola had been ignited, Servatius joined the university's Medwin String Ensemble and discovered a world where technologists embrace art. "It was so incredible, all these engineers getting together to have fun and play music," she says. Servatius went on tour with the string quartet, traveling to Greece, Italy, and Prague, playing in churches and schools and giving workshops.

Now she dares herself to make a living as a musician as she studies for her master's in music at the University of Massachusetts Lowell. "WPI gave me a lot of confidence," Servatius says. "If I can get past people saying, 'There's no way you can do engineering because you're female,' then maybe I can get past the attitude that you can't possibly make a living playing music. And if I can't," she adds, "I have my engineering degree to fall back on."

A man wearing a brown flat cap, glasses, a white collared shirt, and a dark jacket with brown sleeves is smiling broadly. He is holding a large rectangular sign in front of his chest. The background is a bright, cloudy sky with some autumn foliage visible in the top left corner.

Humanly **Possible**

People who say
you can't make
a difference
usually don't.

By Joanne Silver

- ▶ *Transformations* speaks with two inspiring alumni—one at the beginning of her career, the other nearing the end of his—whose passions merge science with life for the greater good.

◀ **Donald Lathrop '56:**

activist, humanist, philosopher,
inventor, semi-retired professor

Don Lathrop is delighted. "I finally figured out how to carry five vases to school," he says, holding up a makeshift tray of flowers from his garden, all intended for colleagues at Berkshire Community College. An ingenious combination of cut juice bottles, water bottles, and duct tape provided the solution. Indeed, none of the plastic vases has fallen over in the car ride from his home in Canaan, N.Y., to Pittsfield, Mass. As his six o'clock class approaches, Lathrop's tightly packed bouquets still radiate color and good health.

Finding a place for the tray is a different sort of feat. Behind a door with a poster announcing "Nuclear Free Zone," Lathrop's office brims with the trappings of an insistently fertile mind. Shelves hold hundreds of books, assorted blue glass vessels, wooden sculptures, and miscellaneous gizmos. Posters, photographs, artworks, and political buttons crowd the walls. One button, designed by the professor, bears the picture of a classical torso and the words: Venus de Milo did it. Disarm.

Humor and an urgent message find their way into many of Lathrop's enterprises—from his poem "To A Square Soap Bubble" to his courses in the "Peace and World Order Studies" department he founded. At 71, the graduate of what was then an all-male Worcester Tech has cut back on his course load, but not on his commitment to nurturing peace and creativity.

In September, he coordinated buses to an antiwar rally in Washington, D.C. He still participates in a peace vigil every Thursday, as he has for the past three years. He writes letters to editors of newspapers about issues global and local, and he composes poems grappling with subjects ranging from his wife's cancer to starving children in war-torn countries. His own bout with cancer inspired a poem about the ill effects he experienced not from the disease, but from the painkiller Oxycontin. Lathrop continues to work with his wife, Marion, on the Never Again Campaign, which the two developed in the 1980s to promote international understanding and spread the message of survivors of the atom bombs dropped on Japan.

As a boy, Lathrop had not yet discovered this voice. "I remember sitting on the floor in my grandmother's house when Pearl Harbor came on the radio," he recalls. "And, much to my current sadness, I don't remember any grief over Hiroshima and Nagasaki at the time. I had cousins serving in the Pacific, and my family was just happy they would be coming home." Now that he knows a number of A-bomb survivors, several of whom have come to visit, he cannot view history as separate from the lives of individuals.

"I didn't want to be in the Army," Lathrop says, but at the end of high school, he had to register. "It showed my cowardice. I hadn't reached the point of King or Ghandi," he admits. "You have to know what you're willing to die for." After WPI, at Fort

Monmouth, N.J., he ended up teaching basic electricity and repair, and he realized he didn't like the Army, but he did like teaching. After a few brief engineering stints, he began a long career in the classroom, first as a physicist, and then gradually meandering toward the humanities. Perhaps he should have seen that change coming. Although his B.S. is in mechanical engineering, Lathrop's favorite class at WPI was Professor Donald Johnson's course on the history and philosophy of ideas. He describes his later academic shift matter-of-factly: "When I taught freshman physics, I probably knew the answer. When I teach the meaning of life, I probably don't."

Even his own existence is shrouded in uncertainty. Adopted by an older couple in New York, Lathrop never knew anything about his birth parents. When his mother and father died during his college years, Lathrop was offered a chance to see his birth certificate. Instead, he had it destroyed. "I'm a planetary citizen," he says. "This is my planet. I have enough trouble being me to want to be someone else, too."

In the process of becoming himself, Lathrop has learned a lot from figures both famous and little known. Active in the civil rights movement, he and Marion went to Washington in 1963 and heard Dr. Martin Luther King Jr. deliver his "I have a dream" speech. More locally, Lathrop mentions Frances Crowe as a person who "inspired people up and down the Pioneer Valley." In early fall, he heard antiwar activist/mother Cindy Sheehan speak at the rally in Washington. Over the years, students from America, Ghana, Japan, Germany, Russia, Myanmar, and elsewhere have lived with the Lathrops as the visitors pursued studies and various activist enterprises. In each case, the professor has seen the interaction as an opportunity to expand his knowledge and his awareness of other points of view.

The same desires motivate him in the evening philosophy class he teaches on world security and sustainability. Ten students from 20 to 70 years old gather in the classroom that once housed Lathrop's creativity class. Leftover student mobiles dangle from every patch of ceiling, giving a festive air to the excruciatingly bland cinderblock environment. "Do you have enough money?" Lathrop begins. One by one, the men and women volunteer their answers. A young man in a Red Sox shirt says he has to wait until payday to fill up his tank with gas. Others feel more secure. All come to realize the question has less to do with an amount than an approach to living. "My roommate and I discuss these things," a 20-something woman responds, adding that she believes she is in the prime of her life. Lathrop smiles. "I'm glad to hear you say you're in the prime of your life," he says. "I am, too. So many people never get to their prime. I don't mean they die. They're just never there."



“I try not to assume anything. I walk through it in relation to their own experiences and priorities.”

▲ **Erica Tworog-Dube '00:**
genetic counselor, improving
the lives of children and adults

Quiet fills the waiting room of the National Birth Defects Center. With no little riders in sight, the toy cars are neatly parked against a wall of windows. Stuffed animals rest on shelves. Cardboard bricks stand in a corner, ready for a new construction project. On this late summer Friday morning, the people who usually visit the Waltham, Mass., office are not in clinic, but they're not far from Erica Tworog-Dube's mind. The young genetic counselor is busy pursuing leads that might help improve the lives of the children and adults who seek out her services.

Working with a team of specialists that includes Dr. Rhonda Spiro and Dr. Murray Feingold, who is also known for his regular appearances on Boston television and radio, Tworog-Dube

spends her days—and often significant chunks of her evenings—investigating the chance occurrences that lead to various genetic disorders. Armed with knowledge and curiosity, she guides children, couples in the midst of a pregnancy, and those contemplating pregnancy toward more fulfilling lives. She coordinates the care of specialists for those born with hereditary disorders and proposes testing for families facing increased odds of a genetic disease. She also intervenes when bureaucracies stand in the way of such services as speech therapy for youngsters living with birth defects.

Despite a scientific background, Tworog-Dube seems more comfortable with questions than answers. She understands that

Humanly Possible

all the genetic testing in the world cannot decide what is right for any one person. And so, the woman who pursued a double major in the humanities and biotechnology at WPI before studying genetic counseling at Brandeis University is quick to speak of the value of myths. Not the ancient type, with legions of gods reigning over the land and seas. Tworog-Dube studies the myths families unwittingly create as they try to make sense out of their loved ones' disabilities.

"I have the opportunity to learn so many family histories, family myths," she says. "'Grandpa Joe had that because he fell from a tree,' or, 'Mom had that because she got sick when she was pregnant.'"

"Myths are useful," she adds, sitting in her office amid folders, science texts, medical test kits, an Ansel Adams photograph of mountains, and a photo with her husband, Matthew Dube '00, taken at their wedding on a Cape Cod beach. "They give me an avenue to explore the issues from the family's perspective. Understanding what *they* thought their child had acknowledges their existing beliefs. It gives me a language to talk with the family."

She realizes that whatever information she imparts will be absorbed in the context of the anecdotes that have been passed along for years and possibly generations. Words become crucial.

"Humanities plays an indirect role," she explains, crediting courses by Professors Wesley Mott (literature) and Steven Bullock (history) for furthering that side of her learning. Phrases can be supportive or dangerous. "For a while," she says of a practice now on the wane, "people put 'FLK' in a child's chart—for 'funny looking kid.' The role of a genetic counselor is to bring sensitivity and educate people why that is entirely inappropriate."

It was a role in a play that first sparked Tworog-Dube's interest in the field. As a high school student in Maine, she acted the part of a girl with PKU, an inherited condition that results in mental retardation unless a strict diet is followed. At WPI, her passions for science and writing guided her two Major Qualifying Projects: one, on wealth and the American dream, for which she won the Provost's MQP Award; the

other, on protein expression in earthworms. In addition, she earned WPI's prestigious Two Towers Award during her junior year. Tworog-Dube proceeded to volunteer at a genetic counseling clinic in Springfield, Mass., work in bioresearch for Abbott Laboratories, and then embark on several internships—from Concord, Mass., to Newcastle, Australia—while a graduate student at Brandeis.

Now, after two years in her current position, she realizes the value of WPI's founding principle of combining theory and practice. Because her patients are often seen by many specialists, she has to be able to deal with biological factors, legal issues, and social considerations, while never losing sight of the human beings themselves. She mentions a little boy she started seeing in 2003, shortly after he was born. At the time, the pediatrician noted that the child had poor muscle tone.

"We don't yet have a diagnosis for this little boy," Tworog-Dube says, as she outlines the high and low points in the life of the toddler and his family. "Since he was born he has had developmental delays—in his motor skills and speech. He has had some feeding problems. The mom became pregnant again, and that baby was born this spring, also with some muscle problems. Some of the issues overlap. The parents are so strong, though. So upbeat. You can see it in the way the older boy has caught up in some areas."

Genetic testing certainly gets a lot of attention these days, and Tworog-Dube acknowledges that new tests become available all the time. Just as critical, however, is the variety of services she coordinates as part of a person's care. If a child has a particular diagnosis associated with heart problems, she makes sure to check for heart problems on a regular basis. If a child is not speaking, she might arrange to have sign language introduced. Finding the right solution can require the expertise of a scientist and the creativity of an artist. Weathering the difficult times demands another set of strengths. Tworog-Dube admits, "It is emotionally draining. There are days when you're dealing with kids who are not doing very well, parents who are very high-risk. Sometimes these are not happy endings."

Whenever possible, she focuses on what can be done—on beginnings, not endings. With couples planning to have children, including those undergoing assisted reproductive procedures, she can help sort through the genetic testing available and the difficult choices that might ensue. Here, too, Tworog-Dube emphasizes options. "Testing can offer reassurance, if it comes back negative," she says. If not, "You can prepare medically. Instead of having a home birth with a nurse midwife, you might go to Children's Hospital, where there's a cardiologist. I try not to assume anything. I walk through it in relation to their own experiences and priorities." ■





Finding Happiness

By Rachel Faugno

Philosophy professor Roger S. Gottlieb cares passionately about society's spiritual and moral well-being, seeing them as inextricably linked to the survival of our planet. This author/editor of 14 books and more than 50 articles on topics including political philosophy, religious life, and environmentalism challenges his students to consider moral aspects of their life choices.

"Our current lifestyle is inflicting mortal damage to the planet. Even if we do not consciously acknowledge this fact, we are aware of it on some deeper level, which causes profound currents of unhappiness," he asserts. "We need to do a much better job of incorporating ethical considerations into private and public policies if we are to heal ourselves and the planet."

Gottlieb is currently working on two books scheduled for publication by Oxford University Press in 2006. One, titled *A Greener Faith: Religious Environmentalism and Our Planet's Future*, is the first full-length study of the social and political aspects of religious environmental activism. The other, *The Oxford Handbook of Religion and Ecology*, is an edited collection of essays by 25 leading scholars on all aspects of the religion-ecology connection. Here, Gottlieb talks about his own moral and spiritual journey and how it impacts his classes at WPI.

What led you to pursue philosophy?

I grew up in White Plains, New York, in a middle-class suburban family. In a lot of ways I was a typical kid, a Boy Scout, a member of the wrestling team. But from an early age I was sensitive to the injustices of the world. The train to Manhattan took us through Harlem, and I remember thinking there was something terribly wrong about the poverty I saw. I grew up in the '60s, when issues of social justice were front and center in the feminist, antiwar, and antipoverty movements. When I went to Brandeis, I thought I'd become a psychologist. But I took one psychology course and found it unbelievably dull. I took one philosophy course and was immediately hooked.

What exactly excited you?

The idea that you could penetrate by sheer mental force the meaning of life, the source of happiness. There was something incredibly powerful about that, something that seemed tremendously important to me. Unfortunately, in those days philosophy was dominated by traditional trappings of masculinity. The goal seemed to be to find the one counterexample that

[Photography by Patrick O'Connor]

would leave the other person's position in the dust. I was lucky, during grad school, to be exposed to feminist ideas about non-competitive ways of talking, learning, and teaching. I learned how to ask the same important questions, but pursue the answers differently.

What is the role of philosophy courses at a technological university?

There was, perhaps, a time in human history when people could claim to be unaware of the consequences of their actions. That is no longer the case. Today, we are almost painfully aware (or should be!) that all of our actions and policies have an impact on the environment, on other species, and on fellow human beings. Therefore, even our personal choices, right down to what we drive and the food we eat, have a moral dimension. The task of philosophy is to challenge students to think seriously about their beliefs and values, to give them the tools to make life choices that will contribute to the development of just and sustainable societies.

What do you hope your students will retain?

I hope that they will apply moral criteria to their personal and professional choices, that they will challenge assumptions, that they will stand up for social justice, and that they will grow throughout their lives as spiritual and ethical beings.

What happens when students don't agree with you?

I hardly expect them to agree! Look, I can't pretend that I'm detached about the fate of the earth or social injustice—who on the *Titanic* could say he doesn't care whether the ship sinks or not? I'm not detached, but I do try to be objective. And my political outlook is that no long-term changes can arise unless people learn to think and act for themselves. I'm not here to indoctrinate, but to awaken. I also think it's critical to treat people—all people—with respect. If a student disagrees, his or her ideas are as important, and deserve as much of a hearing, as mine.

You've written about religious environmental activism. What is that?

Religious leaders around the world are responding seriously to the environmental crisis. I can give you many examples. Pope John Paul II called nature "our sister." The Christian Orthodox spiritual leader Bartholomew said that to pollute is a sin. A remarkable coalition of religious and indigenous groups planted eight million trees in Zimbabwe a few years ago. The entire Sikh community has committed itself to protecting the environment for the next 300 years. A group of Methodist activists confronted Staples about selling paper whose production causes toxic dioxins in the water and the air. And the Sierra Club, a secular environmental group, has worked with the National Council of Churches to champion environmental causes.

Evangelical Christians, Buddhists in Sri Lanka, Reform Jews, bishops in the Philippines—all these and more have taken a stand and taken steps to protect the environment.

Why are religious organizations concerned about the environment?

If you believe that the earth was divinely created, or if you simply believe that we have a moral obligation to leave a habitable world for future generations, environmental protection is a religious issue. And religious leaders carry great weight. Up until a few years ago, many of the fishermen of Madagascar engaged in the practice of dynamiting for fish. It was easy, but it was also destroying marine life. The government told them to stop. Environmental groups told them to stop. Nothing worked until their sheikhs told them the practice was not in keeping with Islamic teachings. They stopped.

Aside from the environment, how would you describe the impact of religion on modern American life?

In the past few years there's been a lot of discussion about the religious right and the secular left. These labels prevent us from getting to the heart of the issues. Many on the right are horrified by drugs, teenage sexuality, the decline of the nuclear family. They're scared by the bankruptcy of our culture. I don't blame them. On the other hand, I am totally opposed to what the religious right thinks is the explanation or solution to these problems, and I think religions in general have a great deal to learn from the analyses and history of the secular left. The point is not bad religion vs. good secular politics. The point is good politics—religious or secular—vs. bad politics.

What forces have shaped your spiritual journey?

In the last 25 years, it has been my experience as a father. I had a son who was born with brain damage. He lived only five days and he never came home from the hospital. Three years later, my third child, my daughter Esther, was born with multiple handicaps. My wife and I took her to 250 doctors and healers. Sometimes I took her to 15 doctor appointments in one month. An event like this puts you in a different world. You're different from your colleagues. And when you have a child like Esther, you're either a spiritual being or you're miserable. In your despair, you come to realize (sometimes) that the only way to a happy life is through love. Other values, the things we were supposed to expect from our children, simply won't work.

And when you're not teaching...

Well, for an old guy I've got a pretty good jump shot. And I like to schmooze with my family and friends, seek out some of the nature that's left and take photos of it, and listen to music. When I'm looking at a bird in flight or listening to a Beethoven quartet, the world, despite everything, is still very beautiful. ■



Virtually There

By Charna Westervelt

On the opening night of *Les Miserables* in April 2004, WPI Music Professor Frederick Bianchi sat in the audience of the Queen's Theatre in London. There, in the city's West End, he listened. He listened to every beat of every measure of every song that night. He listened for each musical line and phrase, anticipating each instrument's entrance. And he listened for the nuances—the fermatas, the rubatos, the musical embellishments.

Bianchi, of course, knew them all. He was completely attuned to the orchestration.

That night, his creation—the virtual orchestra (a.k.a. Sinfonia)—was in the orchestra pit. The show signified a milestone in Bianchi's work, for following the audience's standing ovation, the show's internationally renowned producer, Cameron Mackintosh, turned to this WPI professor and said, "A moment in musical theater history has been achieved tonight."

Now, after nearly 20 years of tweaking and troubleshooting, Bianchi believes that this moment—this international acceptance and recognition—is propelling the virtual orchestra, its concept, and interactive entertainment to the next level. "It's like writing the Bible and then having it endorsed by the Vatican," Bianchi says. "This kind of technology is no longer an experiment."

What started in the mid-'80s as an idea to simulate the

sound and behavior of a live orchestra, in real time, using a sophisticated network of computers, is now revolutionizing the way we listen to, compose, and perform music.

"The Sinfonia isn't just about some music technology people with their heads in computers," he says. "It's an interdisciplinary and diverse activity that requires a broad range of sensibilities."

Patented in 2004 by Bianchi's New York team, Realtime Music, the Sinfonia has been used in more than 15,000 performances worldwide, including the National Broadway tours of *Jekyll & Hyde*, *Evita*, *Phantom of the Opera*, *Annie*, *Ragtime*, *Titanic*, *Miss Saigon*, *The Music Man*, *Cinderella*, *Seussical*, *Oklahoma*, and *Les Miserables*, and the world tour of *Porgy & Bess*. Last February, Bianchi's team collaborated with Cirque du Soleil on its new production, *KA*, at the MGM Grand in Las Vegas.

"Cirque is the essence of live and real-time performance, beyond anything you would see on Broadway or at Disney," says Bianchi. "It's very interactive and nonlinear."

The Sinfonia, played by a musician alongside other live instruments, fit well for Cirque du Soleil, Bianchi says, because the performance of Cirque's music is so flexible and unpredictable. The music needs to reflect what's happening on stage at every moment, even if it's unplanned. If the actors miss a trick, for example, the music must adjust, without the audience noticing. "It's very much like a video game. The musicians are all watching to see what happens, how to react, and which way to go," says Bianchi, who is also a co-founder of the Interactive Media and Game Development program at WPI.

Not only was Cirque du Soleil a good match for Sinfonia, but the show has "pushed the evolution of the instrument as well," Bianchi says. Over the years, the creative design team at Cirque du Soleil had many requirements for the technology, which went beyond the capabilities that Bianchi and his team had ever imagined. At the same time, Bianchi believes the Sinfonia "is ushering in a completely new wave of interactive performance technology."

The virtual orchestra concept dates back to 1986, when Bianchi was director of computer music at the University of Cincinnati's Conservatory of Music. At that time, a production of the opera *Iphigenie en Tauride* was scheduled, but, for various reasons, the orchestra was reluctant to play it, he says.

"I stepped forward and said to the director, 'I think we might be able to put in some type of electronic simulation.' When I think back to it now, our technological resources were laughable compared to today," Bianchi says.

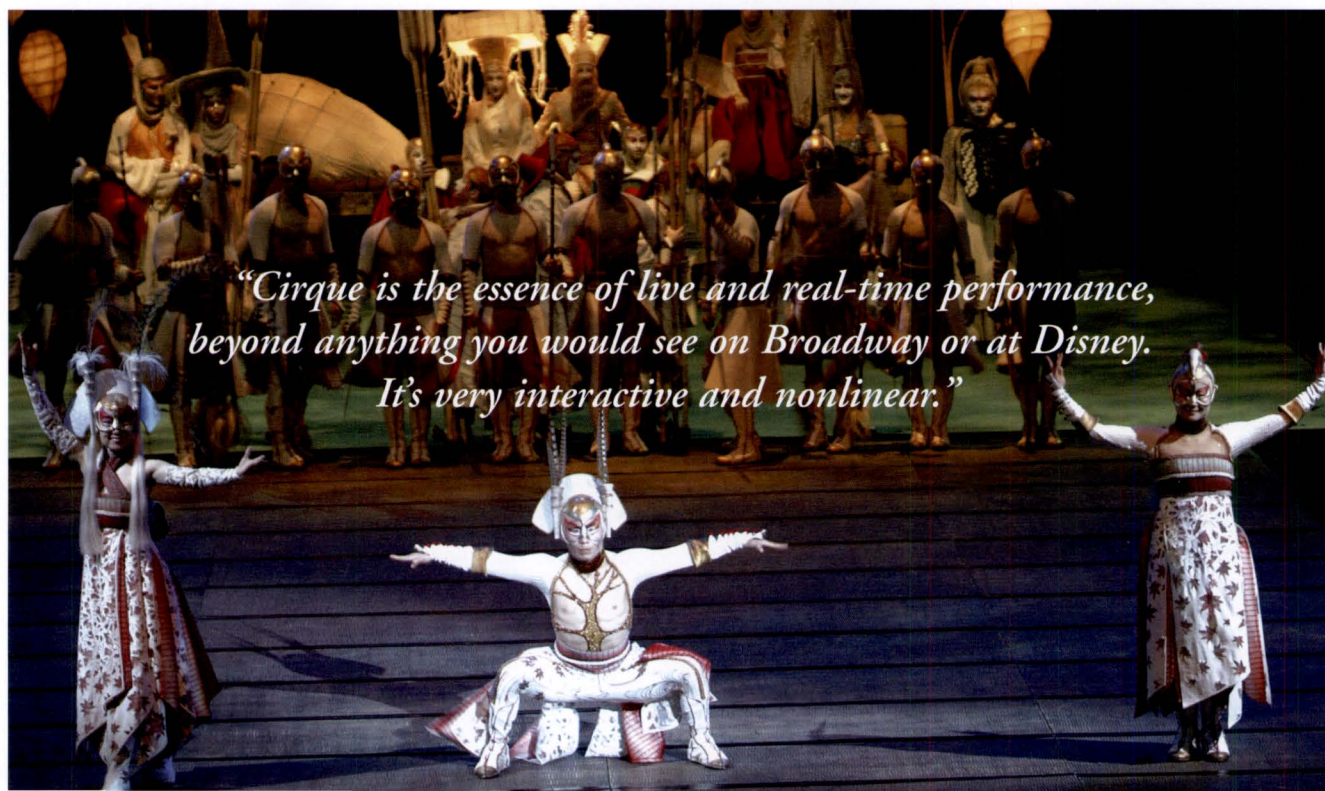
Thus, the evolutionary wheels began turning. The philosophy behind the Sinfonia was borne out of the growing trend in

which support for the performing arts was—and is—declining in the United States. The rising costs of performing an opera or musical—including hiring a full orchestra—have forced theatre companies to raise ticket prices, or even shut down. At the same time, many composers aren't writing theatrical music for orchestral instruments anymore, Bianchi says. "What's out there now are shows that are very loud, spectacular, and high energy. For the audience born after 1945, this has become the logical and accepted aesthetic."

Following the virtual orchestra's debut in Cincinnati, Bianchi formed Realtime Music with partners and co-founders David Smith and Jeff Lazarus. In the early 1990s, the Sinfonia was used for the national production of *The Wizard of Oz*. Those performances led to other engagements, including, in the winter of 1995, the world's first use of this technology with a major opera company. Those performances were picketed by the unions and landed the virtual orchestra in the international spotlight of controversy.

"From an artistic point of view, the idea was always that the virtual orchestra should be good enough to simulate a real orchestra, but the whole thing started a wave of controversy that continues to this day," Bianchi says, adding that it is ultimately up to composers and producers to decide how they want to use the technology.

Philosophically, the idea of integrating such technology into orchestras has been a hard one for many musicians to swallow. "Technology has always been a problem in society—especially when it displaces workers," Bianchi says. "To make matters worse, this is one of the first instances of technology threatening a highly skilled labor pool." He explained that Sinfonia has been used exclusively to complement and enhance, rather than replace, live musicians. "And the outcome has been a positive one for the industry."



"Cirque is the essence of live and real-time performance, beyond anything you would see on Broadway or at Disney. It's very interactive and nonlinear."



“When somebody performs the Sinfonia, they need to understand and be aware of almost everything that is going on in the music.”

The technology has certainly struck a nerve with musicians worldwide. Since the early 1990s, when the virtual orchestra became more widely used, unions have vehemently protested the use of this technology in pit orchestras. In March 2003, when Broadway went on strike for four days, producers threatened to replace musicians with the virtual orchestra. And the New York musicians' union has continued to place the banning of Sinfonia as one of its top priorities.

To Bianchi, the claims against the technology are without merit. “The union likes to reduce its argument to the simplest terms and has thus positioned itself as ‘the humans against the machine.’ But it’s not like that at all,” the professor of music says. “Anyone familiar with the evolution of any technology develops an appreciation and understanding that transcends the moment, and sees beyond the political swagger, myopia, and self-interest of the opposition.”

The evolution of an instrument

As the virtual orchestra became more widely used during the 1990s, its creators received continual feedback from the musicians and composers using it, helping shape and improve the instrument. Over the years, the virtual orchestra has become more compact. It began as a collection of oversized racks and cases in the back of a large truck and has been reduced overall in size and weight. Bianchi expects a laptop version, with the same capabilities as the larger Sinfonia, to be operational in 2006.

The ability to design a laptop version of Sinfonia, Bianchi says, can be attributed to the jump in processor speeds and memory. “Memory and speed are the major liberators in real-time applications,” he says. “In 1986, the basic processor speed was about 10 MHz, so our ideas were really hard to realize.”

In laptop form, the Sinfonia will open itself up to more venues, including amateur productions, Bianchi says. The virtual orchestra could help smaller organizations that don't

have the proper configuration of musicians, instruments, or space. When amateur and professional musicians play alongside Sinfonia, he adds, it helps enhance and support their own musical efforts. He recalls a rehearsal of the national Broadway tour of *Titanic* in 2001, which used the Sinfonia alongside an ensemble of live musicians. The orchestra sounded great, he says, until Sinfonia sat out for one song. Bianchi immediately heard the difference—instruments went flat and musicians missed rhythms.

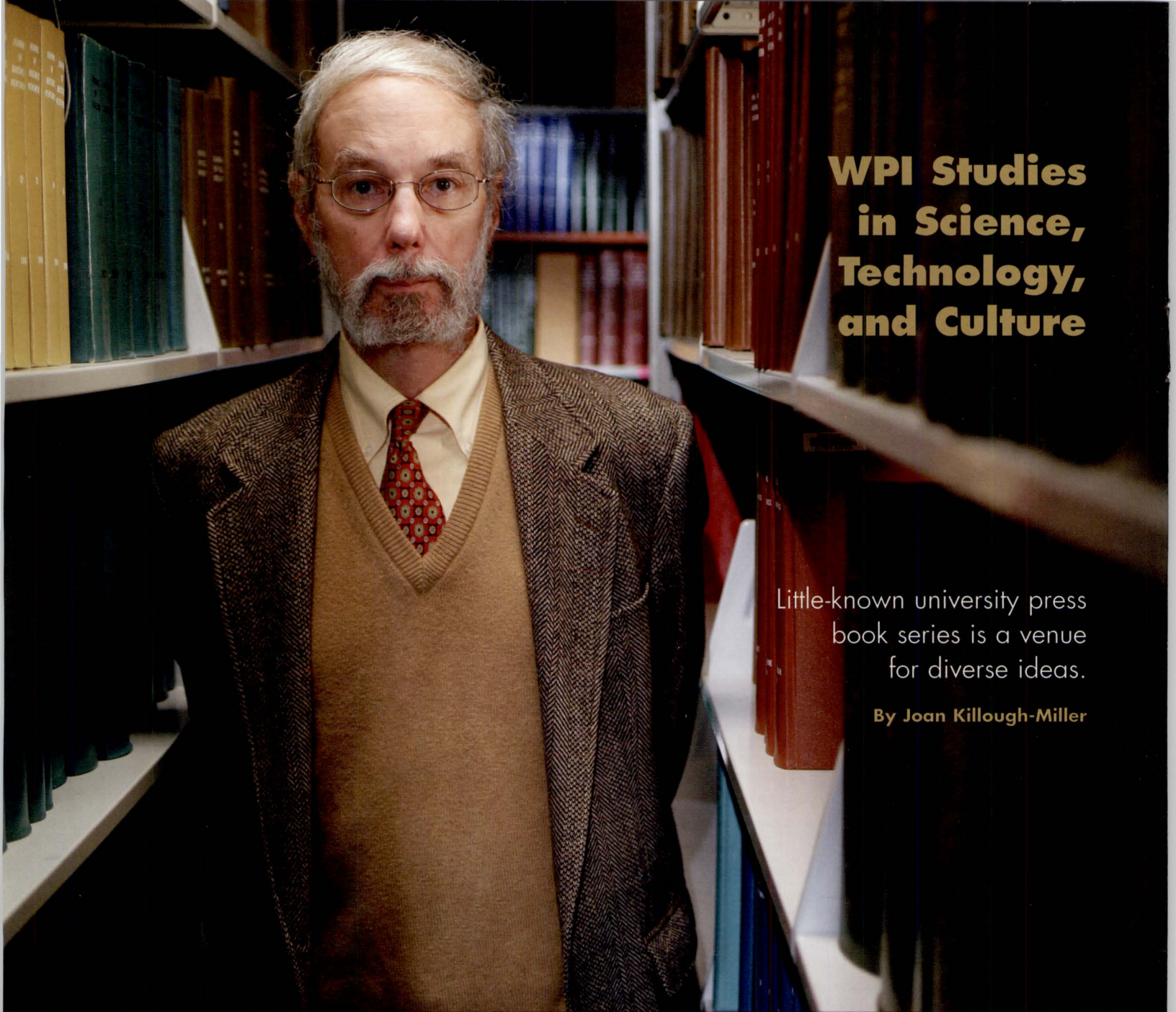
The future of music

Bianchi believes Sinfonia will increasingly be used in future musical performances. That said, the instrument would be ill-suited for music that is indigenous to the acoustic tradition. For example, if the BSO performed a Beethoven symphony, there would be no logic or aesthetic motive to use Sinfonia.

But the question is, What will be the ratio of those traditional types of performances to new types of performances in the future? Bianchi says, “If music has always been a delivery system for new cultural ideas, artists aren't going to continue, or succeed at, creating and expressing themselves with traditional resources. This isn't a death wish onto music. Rather, I'm optimistic that it will push the boundaries of expression.”

As a corollary, Bianchi expects the future demands of being a musician to increase, not get any easier. “When somebody performs the Sinfonia, they need to understand and be aware of almost everything that is going on in the music. The traditional idea of a symphony orchestra—or a large ensemble composed of single, individual components—is becoming a thing of the past,” he says. “Technology and invention have led us in this new direction.”

“You know,” he adds, “if Mozart had had access to a microphone, amplifier, and speakers, he wouldn't have used 20 violin players.” ■



WPI Studies in Science, Technology, and Culture

Little-known university press
book series is a venue
for diverse ideas.

By Joan Killough-Miller

Lance Schachterle, associate provost for academic affairs and professor of English, is editor of the series.

What do Edward Alton Parrish, William Shakespeare, and Marcus Vipsanius Agrippa have in common?

(Answer on next page) For that matter, where can you go to read up on the downside of globalization,

or the interplay of technology and magic in Latin American fiction? The common source for this

wellspring of knowledge is WPI's little-known but wide-ranging university press.

Since 1984, the WPI Studies in Science, Technology, and Culture series has grown to include 20 volumes, published in partnership with Peter Lang Publishing Inc., the North American branch of a European firm founded in the 1920s to help German doctoral candidates disseminate their research. From this traditional niche, Peter Lang has evolved into a multinational force in academic publishing, with offices in Switzerland, England, and the United States.

Lance Schachterle, associate provost for academic affairs and professor of English, serves as general editor for the series, reviewing manuscripts with a committee of faculty experts. "The books have to be on a topic that gets at, in some fashion, the impact of science and technology on some cultural issue; and that link can be philosophical, historical, aesthetic, or political," he says. "Or the inverse—which is less common, but in some ways more interesting—to try to connect the cultural and historical influences of a given time and place to the science and technology that was created in that society."

The series invites contributions from all over and offers WPI's faculty a forum for their unique knowledge. "*In Worcester, Massachusetts: Essays on Elizabeth Bishop* honors Worcester's "brilliant native daughter," the Pulitzer Prize-winning poet whose best-known works are set here. Laura Jehn Menides, who retired from WPI last year as professor of English, served as editor of the monograph, an offshoot from the 1997 Elizabeth Bishop Conference and Poetry Festival that Menides organized at WPI. Associate Professor of Spanish Ángel A. Rivera has

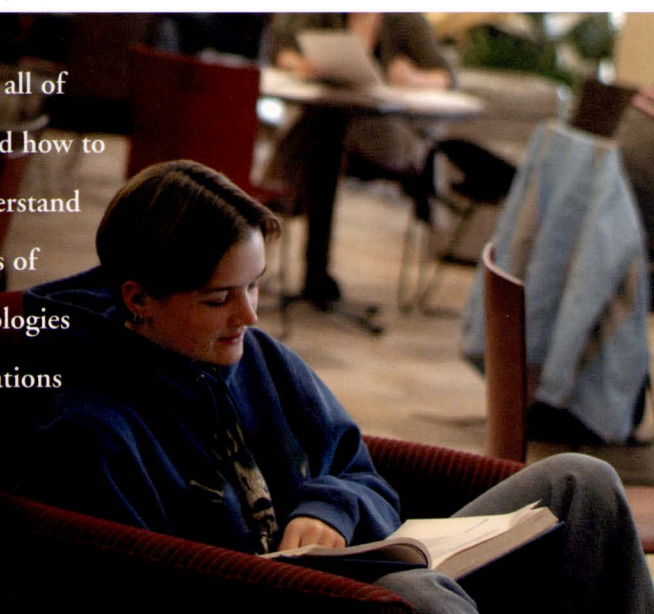
written widely on themes of modernity and modernization in Spanish Caribbean literature. His book *Eugenio María de Hostos y Alejandro Tapia y Rivera: Avatares de una modernidad caribeña* focuses on the influence of two nineteenth century writers on the literature and culture of Puerto Rico.

Although academic publishing is experiencing academic pressures—Northeastern University Press almost went under last year, and others are in jeopardy—the WPI Studies series occupies a unique niche, with a small, but dedicated audience that includes standing orders from university libraries. "Lang specializes in small press runs—typically 300 to 500 copies—of books of a very specific scholarly nature," says Schachterle. "Their business model enables them to make a profit by publishing limited quantities of a large number of titles, worldwide, every year." He points out that even the best sellers from an academic press are rarely blockbusters in the commercial sense.

Schachterle, who has written about physics and technology in the fiction of Thomas Pynchon, says he would like to see the series grow to include some contemporary authors, or some current science fiction that explores cutting-edge issues such as artificial intelligence or the interface of virtual and traditional reality. The best works in the series, he says, underscore WPI's mission: "To ensure that all of our graduates not only understand how to create new technologies, but understand the social and ethical implications of managing those very same technologies and the moral and ethical implications and challenges of the dominance of technology in our culture." ■

For a complete list of titles go to www.peterlangusa.com. A 20 percent discount is available to alumni and members of the WPI community; call Felicia Caggiano at 212-647-7700.

Answer: All are authors or subjects in the series. Parrish, WPI's 14th president, contributed the first chapter of *Liberal Education in Twenty-First Century Engineering*; Shakespeare is the subject of *Broken Symmetry: A Study of Agency in Shakespeare's Plays*; the achievements of Roman inventor-architect Marcus Agrippa (63-12 B.C.) are explored in *The Engineer in History*.



"[WPI's mission] is to ensure that all of our graduates not only understand how to create new technologies, but understand the social and ethical implications of managing those very same technologies and the moral and ethical implications and challenges of the dominance of technology in our culture."

[Photography by Patrick O'Connor]

Reading Between the Lines

The History of Woodbury & Company (2006) and *Liberal Education in 21st Century Engineering* (2004) are just two of 20 books published by WPI Studies in Science, Technology, and Culture series. Below, *Transformations* offers a glimpse into these two titles.

The History of Woodbury & Company

Introduction by James P. Hanlan and Kent P. Ljungquist, edited by Rodney Gormé Obien

In 2002, WPI received an extraordinary donation from the family of John C. Woodbury, an 1876 graduate of the Worcester County Free Institute for Industrial Science (now WPI). Along with a wealth of engravings, records, and artifacts dating back more than a century, was a typewritten manuscript titled "Notes on the History of Woodbury & Company Inc."



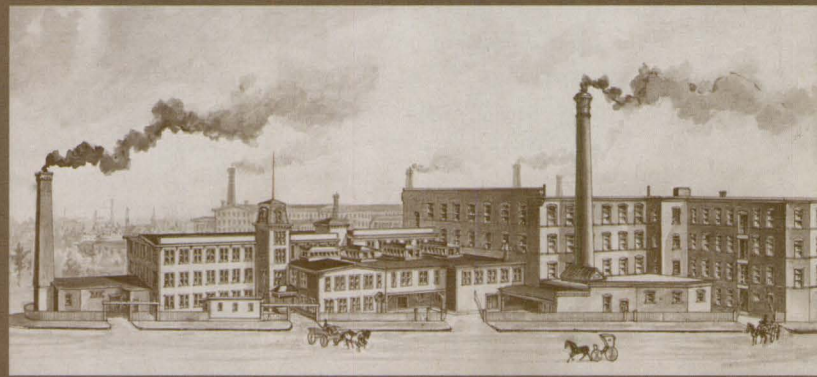
At the turn of the century, Woodbury was the largest commercial engraver in central New England. In its heyday, the company produced everything from fine stationery to first-day covers for commemorative postage stamps (above) to greeting cards for the White House.

The original manuscript, written by Harold D. Woodbury (son of the founder) will be edited by professors James P. Hanlan (history) and Kent P. Ljungquist (English), and university archivist and curator of special collections Rodney Gormé Obien. The three will contribute a scholarly introduction that will underscore Woodbury's contributions to print technology and its significance in Worcester's industrial history. Illustrations will feature a bygone art: "bird's-eye" views of vintage industrial buildings, hand-etched, and rendered in astonishing detail by the photogravure process Woodbury developed to satisfy the era's high standards for quality letterhead (above right).

"It's a WPI story, with four generations of Woodburys who went here," says Obien. "It's more than a company history; it's a history of the printing industry after 1870, which is an under-documented area of study." To survey related sources of information and inspire further research, WPI received a Massachusetts Documentary Heritage Grant, concluding in a symposium to share the findings.

"The scope of the Woodbury collection is just amazing," Obien says. "The written narrative and the company artifacts have great value for graphic artists, historians, and students of American studies, labor history, and economics. It took foresight for the family to save these things and to donate them to us. A lot of companies would have just put it in the Dumpster."

The original manuscript will be brought up to date with an addendum by retired president Kimball R. Woodbury '44, who will address the challenges posed to specialty printing companies by the advent of the information technology era.



Liberal Education in 21st Century Engineering

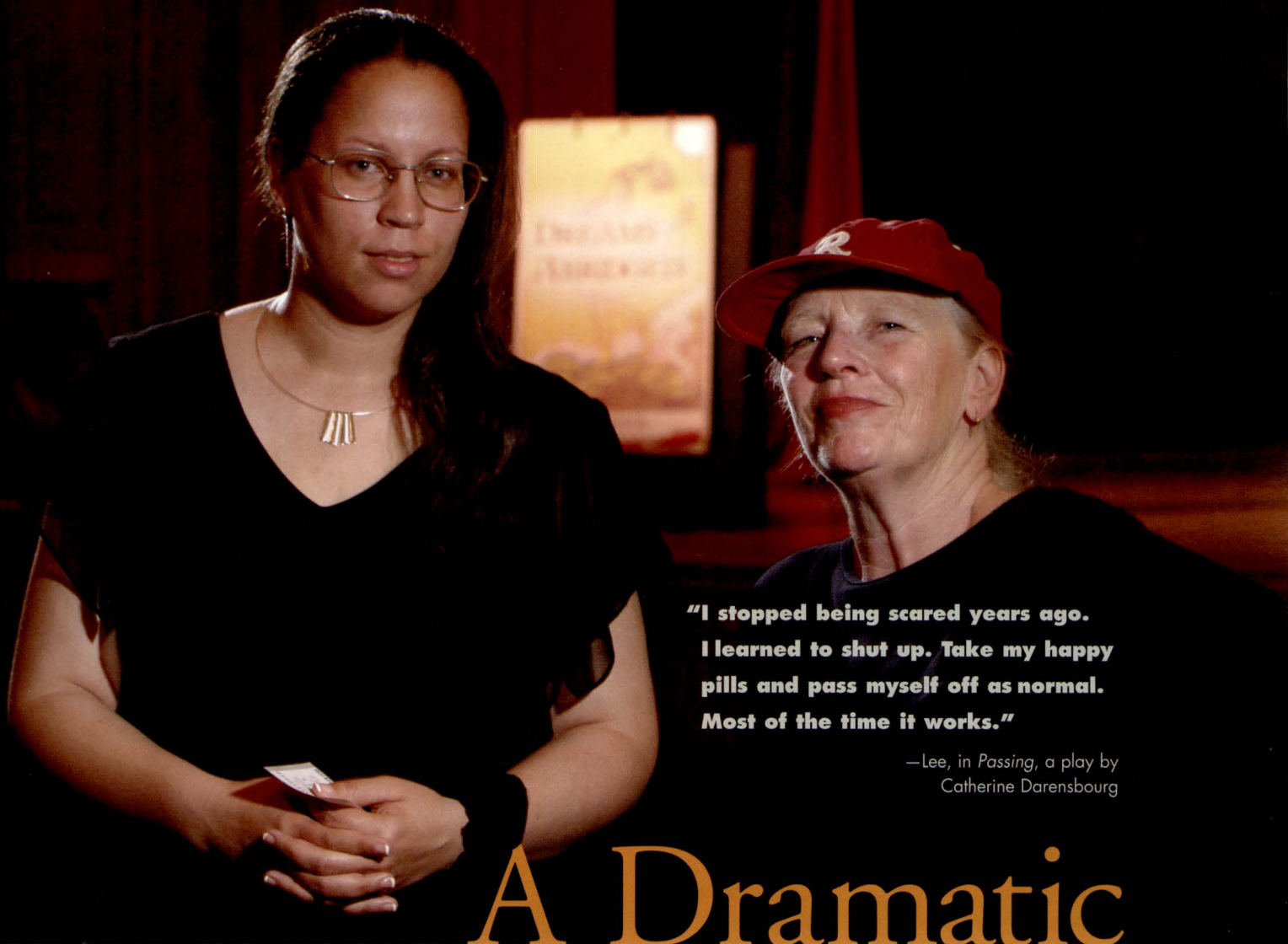
Edited by David F. Ollis, Kathryn A. Neeley, and Heinz C. Luegenbiehl

Since the 1950s, when author C. P. Snow spoke of the gap between the "two cultures" of the sciences and the humanities, there has been ongoing debate over their proper place in the engineering curriculum. In 2000, the Accreditation Board for Engineering and Technology (ABET) issued revised requirements. This volume of essays examines the historical rationale for these "eleven commandments" (often referred to as EC 2000) and explores the challenges and opportunities of this new era in education.

Former WPI president Edward Alton Parrish recaps a half-century of engineering education in the book's first chapter. He documents how guidelines for humanities courses grew from a single page of recommendations into almost 20 pages of detailed requirements, which critics called a rigid "bean-counting" or "cookie-cutter approach" that stifled innovation. Parrish, an ABET fellow, had the honor of making the actual motion to approve the EC 2000 criteria.

Associate Provost Lance Schachterle takes up the meaning of "liberal education" in the next chapter. He traces the term back to its Latin root, *liber*, meaning freedom. In medieval times, a liberal education offered freedom from the servitude of manual labor. In the same sense, Schachterle reminds us that the word "engineer" is linguistically related to ingenuity—problem solving with the head—rather than the manual and mechanical work of fixing engines with the hands. He writes that true liberation will require both "the tools and disciplines requisite for a technological culture" and "the self-reflection and judgment nurtured by study of the collective human achievements."

From Samuel Florman's 1968 classic "The Civilized Engineer," to explorations of contemporary issues of communication, ethics, and aesthetics, *Liberal Engineering* offers a variety of voices to guide faculty, administrators, and institutions through this revolutionary period in engineering education.



"I stopped being scared years ago. I learned to shut up. Take my happy pills and pass myself off as normal. Most of the time it works."

—Lee, in *Passing*, a play by Catherine Darensbourg

A Dramatic Comeback

By John Leonard and Michael W. Dorsey

In *Passing*, a one-act play that debuted last year during the 23rd edition of New Voices, WPI's annual new plays festival, a worker decides to quit her job after failing a workplace drug test rather than admit that the medications she takes are for her mental health. "I'm mentally ill and legitimately medicated," she tells a co-worker. "Have been for a long time."

For playwright Catherine Darensbourg '02, as for the character in her play, mental illness has been a constant companion—and a continual hurdle to overcome—since she was diagnosed almost 13 years ago with schizoaffective disorder, a psychiatric condition that combines elements of schizophrenia and depression.

Her illness extended her undergraduate education into a 14-year marathon, made her daily functioning dependent on medications that have ameliorated her symptoms, though some-

times at a crippling cost, and immersed her in a world of social services that seems designed, principally, to keep her living in poverty. But one thing mental illness could not accomplish was to diminish Darensbourg's creativity, nor her drive to grow as an artist and gain a wider audience for her work.

From her fertile imagination has come a constant stream of plays and short stories, along with an unpublished 180,000-word fantasy novel she wrote as her major project in literature. Fifteen of her plays (a record) have been produced at WPI as part of New Voices. Two have been accepted by the Samuel French Off-Off Broadway Original Short Play Festival, one of the nation's most competitive playwriting contests.

In 2004, *Dreams Abridged*—a shortened version of *The Dreamery*, first performed at WPI in 1992—was mounted by a cast and crew of WPI students, alumni, and staff in the

In general, Darensbourg says her WPI education fostered in her an entrepreneurial spirit. "Whatever their major, WPI gives all graduates an ability to think for themselves."



Above: A scene from the benefit production of Catherine Darensbourg's *Dreams Abridged*, performed at WPI in 2004, before the show was mounted at the Chernuchin Theatre in New York. Opposite page: Cast and crew take their bows. Previous page: Darensbourg and mentor Susan Vick, professor of drama and theatre.

Chernuchin Theatre at the American Theatre of Actors on West 54th Street in New York. It was one of 100 plays selected for the festival that year (from more than 300 submitted). Only one entry would ultimately be published by French, the world's best-known theatrical publisher. Darensbourg made her second trip to the festival this summer with *Passing*, which was also presented at the Chernuchin by a WPI cast and crew.

Another Darensbourg play, *Famous Lost Words*, was a runner up this year in a national new play competition held by the Catholic University of America, and sponsored by the Paul VI Institute for the Arts in Washington, D.C. Along with two other runners up, Darensbourg's play was given a staged reading in April, and playwright-in-residence Jon Klein, author of 20 produced plays, is working with Darensbourg and the other festival winners to develop their works for possible publication.

Most recently, Darensbourg, along with Dean O'Donnell, instructor in WPI's new Interactive Media and Game Development major program (and also a frequent New Voices contributor), was commissioned to write a new play for the opening of WPI's Little Theatre (see page 9). The play, *Prime Time Crime: Teal Version*, debuted on Nov. 17.

While Darensbourg is known today at WPI as a playwright, her hope when she arrived on campus in 1988 was to become a mechanical engineer. Born in New York City and adopted as an infant by a couple in Lafayette, La., she was an excellent student through grade school and finished high school at the top of her

class and as a national merit finalist. Her strong academic skills masked a learning disorder that only became apparent when she began tackling calculus and other high-level math courses at WPI.

In her first term, finding herself struggling more than most of her classmates, she discovered that she suffered from dyscalculia, which is characterized by a difficulty in visualizing numbers. "Genetics was beginning to catch up with me," she says.

In 1992, now wrestling with financial as well as academic difficulties, she transferred from WPI to Worcester State College. The following year, less than two weeks before Christmas, another thread in Darensbourg's genetic tapestry came to the surface. She suffered a nervous breakdown and began to hear a voice in her head that identified itself as God and informed her that she was going to die.

She dropped out of Worcester State and went to work to pay her medical bills, which soon mushroomed to twice her monthly salary. Then she lost the job, and finally her apartment. "A lot of my life came to a screeching halt," she says.

Medication helped her counter the effects of the schizo-affective disorder, though at times it proved more taxing than the illness it was supposed to treat. Clozeril, one of the first anti-psychotic drugs she took, enabled her to write one of her first plays, *Descent from Eden*, but left her feeling so depleted that she slept 16 to 18 hours a day. "They kept trying new medications, because they realized I was never going to keep up," she says. "But I lost years of my life that way."



Medication, along with various federal, state, and local assistance programs, and Darensbourg's own determination, have all played a role in helping her rally back from a debilitating disease, as has regular church attendance. "Whether there is a divinity or not," she says, "the mental discipline of just saying prayers, meditating, and focusing, over a long period of time, can act the same way that braces can act for your teeth."

But just as important to her recovery, Darensbourg says, were the people who believed in her and never saw her as a lost cause. "I give people a lot of credit for not just brushing me off," she says, "because I was totally out of it."

At WPI, where she was eventually able to re-enroll, those guardian angels included Ann Garvin, director of student advising, who was convinced that Darensbourg's ever lengthening WPI student career could one day end successfully. "She would say, 'What do you have that you can graduate in? Once you've got a degree, how is that going to help you survive? How can you be sure that you end up with something that's more than just a piece of paper?'"

Garvin was also a fan of Darensbourg's writing and brought her work to the attention of Susan Vick, professor of drama and theatre. "Garvin was Catherine's biggest advocate here," Vick says. "I can't begin tell you what that woman did for her."

Darensbourg, in turn, credits Vick with helping nurture her potential as an artist. "None of this would have been possible without Susan Vick," she says. "She was always cheering me on. She'd come around near the New Voices deadline and say, 'You're going to turn something in, right?' She was not exactly cracking the whip, but she wasn't giving me milk and cookies and saying, 'You poor dear.' It was a nice balance between the two."

In May 2002, Darensbourg received her bachelor of science degree, with distinction, in literature with a concentration in drama. Though she changed her major, she credits her engineering studies with stimulating her interest in technology (reflected in her science fiction stories, which often feature ingenious gadgets) and her own success as an inventor. (She won third

place in WPI's 2005 Strage Innovation Awards, honoring young inventors who can translate good ideas into viable products, for a disposable cleansing mitt she developed with Alexandra Levshin '05). In general, she says her WPI education fostered in her an entrepreneurial spirit. "Whatever their major, WPI gives all graduates an ability to think for themselves," she says.

Darensbourg says she has decided to apply her entrepreneurial bent to writing, a career choice she made over the objections of her mental health care providers, who frequently urged her to find a more dependable way to make a living, like clerking in a store or waiting tables. Her chosen profession has necessitated an austere lifestyle.

Despite her dramatic comeback and prolific output, Darensbourg lives modestly in an apartment provided by the Worcester Residential Assistance Program. She is careful not to exceed the income limitations dictated by the federal Social Security Disability Income program to avoid losing the funds she needs to buy her medications. She supplements the little she can earn from writing with other artistic pursuits, including pottery, enameling, lamp-working, embroidery, and metalwork. She also paints and draws. "To keep my sanity," she says, "the tradeoff is poverty."

If her recent successes are any indication, Darensbourg may not have to make that tradeoff too much longer. But Vick levens her enthusiasm for Darensbourg's talent with her own knowledge of the cold reality of the entertainment business. She says she has seen many students try to make it over the years; most of the people who enter the field remain on the bottom, and only a few come out on top. Far fewer find any kind of happy medium. "You can't make a living, but you can make a killing," Vick says.

For her part, Darensbourg seems to have adjusted to life on an extremely tight budget, and even accepted it with grace and humor. "If I live very carefully on my disability, I can do it," she says. "And with help and assistance and people throwing peanut butter sandwiches my way, life is good." ■

Class Notes

Staying Connected with Old Friends

Material for Class Notes comes from newspaper and magazine clippings, press releases, and information supplied by alumni. Due to production schedules, some notes may be out of date at publication, but may be updated in future issues. Please allow up to 6 months for your news to appear in print. Submit your Class Note at www.wpi.edu/+Transformations or alumni-editor@wpi.edu. You may fax it to 508-831-5604, or mail it to Alumni Editor, Transformations, WPI, 100 Institute Road, Worcester, MA 01609-2280.

1930s



Ham Gurnham '36 has been making news with a profile in *The Island Packet* describing his adventurous history and his active lifestyle. Ham retired to Florida and enjoyed traveling the country by motor home with his wife, Marti, who died in 1998. He recently moved to Hilton Head, S.C., to be closer to family. In June Ham drove back to Florida, solo—almost 500 miles round trip—to visit with old friends. His routine includes daily walks and baking sweets for his neighbors at Indigo Pines. *Photo by Erin Painter, courtesy, THE ISLAND PACKET.*

1940s

Dan Lewis '47 in Bethesda, Md., writes, "A recent computer crash wiped out my address book. I would appreciate e-mail notes from any of my '47 classmates at dan.lewis@verizon.net."

1950s

Clayton Roberts '50 addressed the IEEE Syracuse Section in September. His topic was the Duryea racecar designed and built by his grandfather in 1842. The Duryea, believed to be the world's first gasoline-powered engine, is now in the Smithsonian. Clayton is president of Mars Hill Broadcasting Co. in Syracuse, N.Y.

Charles Dechand '53 was honored as Citizen of the Year by the Bloomfield (Conn.) Civitan Club. His civic activities include membership in the Hartford Artists Collective, the Connecticut Society of Genealogists, and the Wintonbury Historical Society. He is also active with the local cable TV station.

Dave Dayton '55 and his wife, Shirley (Grange), recently celebrated their 50th anniversary. They have five children, who have given them 10 grandchildren. Dave earned an MBA at Northeastern and launched several nonprofits devoted to job creation and criminal justice reform. He is retired from Northeast Utilities, but continues consulting and writing fiction.

Bill Rabinovitch '58 completed a documentary about artist James Rosenquist. Bill appeared on television again recently, when ABC rebroadcast a "20/20" television segment with his comments about controversies in the art world.

Norm Taupeka '58 put himself up for auction in a fund-raiser for the Dennis (Mass.) Conservation Trust. A humorous article in the *Cape Cod Times* described him as "kind, generous, modest." After a 35-year career as a civilian engineer for the Army, Norm retired to the Cape with his wife, Catherine, who died three years ago.

Arthur Halprin '59 is retired from the University of Delaware as emeritus professor of physics and astronomy. He lives in Newark, Del., where he is a mentor at West Park Elementary School.

1960s

Sang Ki Lee '60 retired from Handong Global University in Korea, where he spent the last five years establishing a graduate

program in international law. Handong International Law School graduated its charter class in December 2004; several graduates took the Tennessee Bar exam this year, and two were admitted. Lee continues in an advisory capacity.

Richard Healing '64 retired from the National Transportation Safety Board. Since 2003, he has served on the board as an advocate for increased aviation safety and a champion of emerging safety technologies.



Al Malchiodi '64 retired from Electric Boat, where he started as an electric design engineer and advanced through the ranks to become a nationally recognized leader in submarine concept formulation. EB president **John Casey '76** said, "Al has led the way in the development of critically important submarine technology and design with a combination of the highest degree of professionalism, even-handedness, and good nature." Al and his wife, Tillie, live in East Lyme, Conn.

Walter Massie '64 retired after 40 years of teaching. In his 35 years at Delft University of Technology in The Netherlands, where he was associate professor of offshore engineering, his field developed from a single elective course to a fully independent master of science degree curriculum. Offshore engineering includes the design of structures for the oil and gas industry and, more recently, offshore wind turbines.

Fran Barton '68 was named CFO for UTStarcom Inc. in Shanghai.

**Wayne Turnblom '68**

was appointed to the board of directors of Foresight Science & Technology and named director, Northeast Regional Office. The company provides business development and technology transfer services to the global high-tech world. Turnblom joined Foresight in 2004 after a long career with Eastman Kodak Co. He also serves on WPI's Chemistry and Biochemistry Advisory Board.



Tony Leketa '69 was promoted to division manager of the Facilities, Environment and Resource Management Division at Parsons. He is retired from a 35-year

career with the Army Corps of Engineers, where he served as chief of Interagency and International Services. From October 2003 to May 2004, he served in Iraq as director of construction for the Coalition Provisional Authority's Program Management Office in Baghdad.

Robert Scott '69 was named 2005 City Employee of the Year in Virginia Beach, Va., where he has served 32 years on the Planning Board, as director since 1975.



Dennis Murphy '69 and his wife, Diane Young, organized this Labor Day mini-reunion in Mystic, Conn., which included great food, and plenty of laughs and reminiscences. "The good news was that none of us had changed a bit since 1969," he notes. Attending were (above, without wives, from front left) Joan and **Bob Smith**, Sheila and **Don Sharp**, Nancy and **David Zlotek**, **Jeff Bernard**, Denise and **Bob Scott**, Carol and **Harold Hemond**, **Dennis Murphy**, Carol and **Gordon Miller**, and Aline and **Ed Mierzejewski**.

1970s

David Emery '70, a former Republican U.S. representative and Maine state congressman, announced his candidacy for governor of Maine last spring, but withdrew in July. His press statement expressed his wish to spare his party a protracted and expensive primary election contest, and to focus on defeating the incumbent.

Domenic Forcella '70's *Blues Beat* column has expanded to four more newspapers in Connecticut, with readership throughout the state. His weekly commentary and club listings began in the New Britain *Herald* nine years ago, and now appear in the weekend entertainment section of eight papers.

Randolph Sablich '70 is vice president and director of C4ISR Programs Dynamics Research Corp. in Lexington, Mass.

Donald Polonis '72 is chief product cost engineer for K and M Electronics, now a wholly owned subsidiary of ITT Industries. "We power the intelligence that makes night vision, mass spectrometry, radar, field communications, and missile systems work," he writes. Donald and his wife, Patricia, (married since the week after graduation), have enjoyed traveling to see the pyramids of Egypt and the natural wonders of the American Southwest.



Bill '73 and **Holly (Keyes) Ault '74** reside in "The Manse" (circa 1830), built by WPI founder John Boynton. The house is the parsonage for the First Church of Templeton, where Bill is pastor. "It was quite a thrill—with five WPI degrees between the two of us—to have the opportunity to live in this historic house," says Holly. She continues at WPI as associate professor of mechanical engineering.

Alden Bianchi '74 was appointed to the board of the New England Employee Benefits Council.

In the Public Eye

The **Boston Herald** speculated about **Dean Stratouly '74's** decision to pull out of a \$400 million condo development in Las Vegas, calling him "the high-rolling dealmaker of Boston's colorful development world" ... ExxonMobil Chemical Co. president **Mike Dolan '75** was profiled in a cover story called "Formula for the Future," in **Continental**, the airline's in-flight magazine ... Director of Firesafety Studies **Kathy Notarianni '86** appeared on **CBS News** and was featured in other national media outlets in October with tips for National Fire Safety Month—from a mother of three **Todd BenDor '02** won the **System Dynamics Society's** 2005 Dana Meadows Award for his work on nature preservation ... the **Boston Globe** covered **Jason Reposa '02's** mission to bring computers and technology training to schools in Honduras, his homeland. Reposa, co-founder of WPI's video game development club, established a nonprofit foundation to collect and ship donated computers, and spent a month assisting schools in the Tela area of Honduras.



Leonard Brzozowski '74 was named director of the Center for Leadership Development at Walsh College in Michigan. He is an adjunct professor of organizational leadership in the MBA program and the founder of Robotron Corp.

Thomas Frink '74 was ordained a priest at the Church of Saint Ignatius of Loyola in Chestnut Hill, Mass., last spring; he entered the Society of Jesus in 1995. He holds master's degrees in pastoral counseling and divinity, and is currently working toward a degree in Systematic Theology at Weston Jesuit School of Theology.

Frank Schlegel '75 was named global business director of Crompton's rubber chemicals business. He has been with the company since his graduation.



Ray Dunn '78 was named president of the New England Society of Plastic and Reconstructive Surgeons. He continues as chief of the Division of Plastic and Reconstructive Surgery at UMass Memorial Health Care in Worcester, and as adjunct professor of biomedical engineering at WPI.

1981

Eduardo Navarro lives in Panama, where his artwork has been garnering international recognition. His acrylic painting "Sala de Espera" (Waiting Lounge) won a bronze award in the 1996 Osaka Triennial, an

honor that the local newspaper *El Panamá América* called "the biggest announcement in the field of art in Panama."

Stuart Shapiro co-authored a research paper called "Location and orientation of Triclosan in phospholipid model membranes," which was featured online in *Resonans*, the e-zine of Wiley's NMR Knowledge Base, under the headline "Cracking eggs to test a bactericide." The team's study was originally published in the *European Biophysics Journal* in 2004.

1983

Alan Carpenter joined the civil engineering department of BL Companies in Meriden, Conn., as a senior project manager.

Karen Casella was recently named vice president of product development at SHOP.COM in Monterey, Calif. After 11 years at Sun Microsystems, and a short stint

at eBay, Karen left behind the long commute and the hustle and bustle of Silicon Valley for work closer to home, in idyllic Monterey, where she and her family had relocated six years ago.

In August, **Kevin Manning** celebrated his 20th anniversary at Ticona, the technical polymer business of Celanese Corp. He and his wife, Alexa, relocated from northwestern New Jersey to the greater Cincinnati area last year. He now works at Ticona's new headquarters in Florence, Ky., and lives in New Richmond, Ohio.

1985

Jay Cormier works for Mindspeed Technologies as a senior vice president and general manager of one of the firm's business units.

Jeff Stevens manages the Broadband Wireless Access Group at Analog Devices.

1986

Christopher Adams joined Northeast Utilities in 2004. From East Hartford, Conn., he writes, "My wife and I were blessed with the birth of our daughter, Kallista, in 2002. She joined her three older brothers in a household full of fun, soccer balls, bicycles, and computers."

Edward Childs joined Back Bay Financial Group as an operations analyst/financial planning assistant.

Craig Gosselin was appointed chief marketing and sales officer for Velocita Wireless in Woodbridge, N.J.

Marie Harriman writes, "I am proud to announce I have a short essay published in a new book, *Cheaper Than Therapy*. The book, edited by fiber artist Annie Modesitt, discusses the subject of joy, healing, and life lessons in fiber, specifically knitting. I learned how to knit during my junior year at WPI, while studying in Sweden. Since becoming disabled almost three years ago, I've had the opportunity to revisit this hobby. My essay incorporates the experiences of being disabled and living with a chronic illness."

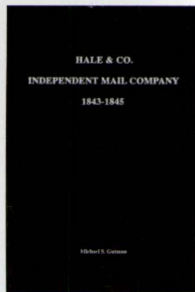
"We recently moved back to Massachusetts for new career opportunities," writes **John Pacheco**. "I am manager of technology development at Welch Foods, maker of grape juice and jellies. My wife, Dana, is accounting manager with the Fenn School in Concord." They live in Acton with their children, Joey, 9, and Katy, 7.

Bookshelf

Recent and new publications by WPI alumni, faculty, staff

Hale & Co. Independent Mail Company 1843-1845

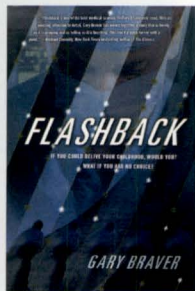
by Michael S. Gutman '58



Gutman's self-published history chronicles the rival mail service founded by James W. Hale, who in 1843 promised cheaper and faster delivery than the U.S. government. In its heyday, Hale & Co. may have handled up to 60,000 pieces of mail a day. Cooperative agreements with other companies extended the network's reach as far west as Chicago, with overseas forwarding capabilities, as well. Drawing on his personal database of 1,377 covers and consultations with other collectors, Gutman has reconstructed the complex operations of this maverick entrepreneur. The high-quality hardcover volume includes more than 350 monochrome images, plus a 16-page color insert. To purchase, contact Gutman at mkeg94@comcast.net or 508-477-6206.

Flashback

by Gary Braver (Gary Goshgarian '64) *A Forge Hardcover*



Goshgarian's newest medical thriller centers on the race to produce a cure for Alzheimer's disease—a cure that might be working too well, producing violent behavior in test subjects, who are sometimes overwhelmed by disturbing memories. There's big money at stake and powerful forces backing the new discovery—but pharmacologist René Ballard has doubts about the safety of the drug known as "Memorine." She finds an ally in Jack Koryan, a man who has survived a life-threatening attack by tropical jellyfish, only to find himself plagued by bizarre neural flashbacks. As they uncover the truth about Jack's past and the jellyfish toxin—which is the pharmacological basis of Memorine—they uncover a sinister pattern of lies and deceit that have left a trail of bodies, and several elderly patients who are unable—or unwilling—to emerge from the past.

1988

Lt. Col. **Robert Provost**, USAF, was assigned to Fort Meade, Md.; his wife, Cindy, serves in the Air Force, as lieutenant colonel at Bolling AFB in Washington, D.C. Rob also operates Grand Slam Fly-fishing Destinations (grandslamflyfishing.com), specializing in hosted fly-fishing trips to premier freshwater and saltwater destinations around the world.

Lisa Partridge Sylvia was named director of the Otis [Elevator] Innovation Program at United Technologies Research Center in East Hartford, Conn. She and her husband, Norman, live in Tolland.

David Welch married Leigh Withington on April 23, 2005. They live in Northborough, Mass.

1989

Michael Fitzpatrick writes, "After three years on the Central Artery/Tunnel project, I have accepted a new position as deputy director of security for the Massachusetts Turnpike Authority."

Alison Gotkin is employed at K and M Electronics in the key role of business development manager.



Fran Hoey III received the 2005 Lester Gaynor Award from the Boston Society of Civil Engineers. He was honored for his service to the community of Holyoke, Mass.

Hoey is senior vice president of Tighe & Bond in Westfield, Mass.

Deborah (Reisinger) Neville is director of business analysis at Elan Drug Delivery in King of Prussia, Pa.

1990



Joseph Cormier joined SEA Consultants as principal transportation engineer. He served as bridge segment design manager and construction phase manager on Mass-Highway's recent Route 3 North Transportation Improvements Project.

Major **Jeffrey Hebert**, USAF, was named commander of the 31st Test Squadron, Det. 1, at Kirtland Air Force Base in Albuquerque.

John Lombardi was selected Man of the Year from among Tucson's 40 Under 40, in recognition of his business and community efforts. His company, Ventana Research Corp., is expected to grow from \$1.5 million to \$5 million in revenues next year, with contracts from overseas companies.

1991

Joseph Barbagallo joined Woodard & Curran as a vice president. He lives in Somers, N.Y.

Bob Beliveau is a technical account manager at Netformx, (netformx.com) a network design and procurement software company. "I am also the CTO of my in-laws' business, mariasantiques.com. My wife, Deborah, and I have a son, Robert Armstrong, born in 2003. In my spare time I enjoy racing my 2005 Roush Mustang."

Rob Bennett manages Microsoft's online music efforts as senior director of MSN Entertainment. On Sept. 23, 2004, he and his wife, Alana, welcomed a daughter, Grace Elizabeth, into the world. "We are adjusting to parenthood," he writes.

Rebecca Harasimowicz married Thomas Raczkowski in July. She works at Independent Health in Amherst, N.Y.

Michael Maglio was promoted to director of transportation at Tibbetts Engineering Corp.

1993

Matthew Boutell received a Ph.D. in computer science from the University of Rochester in May. He recently joined the faculty of Rose-Hulman Institute of Technology as an assistant professor.

Peter Hanson lives in Cromwell, Conn., with his wife, Rachel (McIntyre), and sons Camden and Riley. Peter recently joined DiCesare-Bentley Engineers as a structural engineering manager, charged with starting, managing, and expanding a new structural department at an established surveying and site engineering firm.

Bill Lewis and his wife, Julie, are happy to announce the birth of their third child, Owen William, on April 22, 2005. His sisters, Caroline, 5, and Jillian, 2 1/2, love their new brother very much. The family lives in Ellicott City, Md.

1994

Christine Jesensky Bennett and Benjamin Bennett '96 welcomed their second son, Nicholas Michael, on June 16, 2005. "Big brother Tim is enjoying his 'baby bruvva' and is especially fascinated with Cole's 'leetle toes,'" they write. They live in Bedford, Mass.

Ted Dysart was appointed managing partner of the Americas for Heidrick & Struggles International's Global Board of Directors practice. He joined the executive search and leadership consulting firm in 2001. Dysart is also a regular commentator on the subject of corporate governance for the *New York Times*, *USA Today*, and the *Wall Street Journal*, and on CNN and CNNfn.

Anette (Berg-Sonne) LeFave and her husband, Joel, are happy to announce the birth of Noah David on Sept. 8, 2005. They and big brothers Erik, 9, and Ryan, 6, live in Mendon, Mass.

Nathan Seifert joined Churchill & Banks Construction as a project manager. He lives in Mansfield, Mass.

Kristina Zierold accepted a faculty position at Wake Forest University in North Carolina. Kris is an environmental epidemiologist whose research focuses on environmental and occupational risk factors in the development of diseases.

1995



Gilda (Medeiros) and John Aliberti '96 are thrilled to announce the birth of their first child, Evan Joseph (shown at Homecoming), on May 26, 2005. Gilda continues as a section manager for PTC, where she has worked for seven years. John has been with Pegasystems for nine years and is a software engineer. They live in Billerica, Mass.

Renee Cusson and Justin Koller were married at Higgins House on Sept. 25, 2004, with many alumni in attendance. Renee received her master's degree in architecture in 1998 and an M.S. in structural engineering in 2002, both from the University of Colorado, where she currently works. Justin is an engineer for Quantum Corp.

Jeralyn Haraldsen earned a Ph.D. at Tufts University's Sackler School of Biomedical Sciences. She is continuing her postdoctoral work at the University of Vermont.

Jeremy Little and his wife, Donna, are proud to announce the birth of their first child, Spencer William, on June 21, 2005. They live in Wakefield, Mass.



Nick and Valerie (Kolak) Mollo '97 welcomed their first child, Tanya Nicole, on Aug. 21, 2005. Nick is a flow lab leader for GE Sensing, and Valerie is an RDS software engineer for Bose. The family lives in Wilmington, Mass.



Kathleen (Paulauskas) Moore and her husband, Gavin, welcomed their first child, Gavin William Jr., on Dec. 1, 2004. "It is an interesting home," she writes, "as Gavin is being

exposed to both his Red Sox and his Yankee heritage!" Kathy is a mathematics teacher at Syosset High School on Long Island, N.Y.

1996

Greta Boynton writes, "After finishing my residency in internal medicine and a year as chief medical resident at Baystate Medical Center, I am now a full-time hospitalist at BMC. I was recently appointed assistant director for the Community Hospitalist Medicine Program." Greta lives in Connecticut with her husband, Mario Bruno, and daughter, Isabella.

Antonio Delgado works for Baker Hughes Inc., a Houston-based petroleum service company, as health, safety, and environmental coordinator for Latin America. He is currently assigned to Baker Petrolite, a specialty chemicals division of the company, and is based in Caracas, Venezuela, where he lives with his wife, Edwani, and daughter, Oriana.

1997



John Digiacocone won a chance to conduct "The Stars and Stripes Forever" at Boston's Hatch Shell in July, with the Metropolitan Wind Symphony. He bid for the honor in a fund-raising auction on eBay at the prompting of his girlfriend, Jennifer Mabb, who is a substitute flutist with the group. When not waving the baton and supporting the arts, Digiacocone is a project engineer for the Natick Department of Public Works.

Brian Houle married Kelly O'Neill in Aruba recently. He is marketing manager for Solidworks Corp. in Cambridge, Mass.

Tae-kyung Im has been a popular light tenor in Korea, singing in nationally televised charity events and branching out into roles in original musical dramas. The *Korea Herald* dubbed him a "crossover success," and wrote, "Im has fascinated local music fans with his masculine vocals that are warm but dynamic and charismatic."

Shawn Marshall and Jennifer Wright '99 were married May 29, 2004. He is an engineer for Liberty Mutual in Chicago, and she is a second-year resident at Northwestern Hospital.

Corey Maynard works for Gillette. He lives in Dudley, Mass., with his wife, Mary Ann.

Stephanie Torrey successfully defended her doctoral thesis in animal behavior at the University of Guelph, Ontario, Canada. She accepted a research scientist position with Agriculture and Agri-Food Canada, a division of the Canadian federal government, based out of Lennoxville, Quebec.

Navy Lt. **Nicole Treeman** received three advanced degrees in the spring of 2005—a master's in finance from Bryant University and, from MIT, a master of engineering degree and a master of science in nuclear engineering. She is now serving at the Naval National Nuclear Reactors in Washington, D.C., where she lives with her husband, Navy Lt. Lorne Reinke, and daughter, Ariadne.

Row On!



Deb McCabe '90 and Jessica McAlear '04 joined forces to race the women's double at the Master's National Championship regatta on Lake Quinsigamond this year. The two rowed against crews from across the country and emerged as national champions by winning the gold medal in the A age category (crew average age between 27 and 35), "making it good to be both old and young," they write.

In the men's division, four alumni from the Class of 1971, (**Greg Dickson, Doug Michael, Paul Popinchalk, and Don Usher**) placed 6th in their age division (50-59), rowing together as "Friends of WPI Rowing."

1998

Navy Lt. **Slade Brockett** and his wife, Mary, are proud to announce the birth of their third child, Emma, on June 11, 2005, in Bremerton, Wash.



Greg Cuetara works for Harriman Associates in Auburn, Maine, where he recently received his P.E. license in structural engineering.

Benjamin Fisk and Karen (Lee) Fisk '99 are thrilled to announce the birth of their daughter, Rachel Cathryn, born Aug. 25, 2005. They live in East Granby, Conn.

Ken Lewis and his wife, Cheryl, had a daughter, Quinn Alexandria, on April 16, 2005. They live in Scarborough, Maine. Ken is a senior engineer at National Semiconductor.

Elana (Kingsbury) and **Rich Person '96** are happy to announce the birth of their third son, Maxwell, on May 16, 2005. Big brothers Tim and Sam are very proud of their new little brother. They live in Hudson, Mass.

Seth Popinchalk and his wife, Susan, had a second daughter, Lauren Samantha, born on Mother's Day, May 8, 2005. "Both mother and baby are doing great, and big sister Kathryn, 2, was so happy to have her baby sister arrive," he writes. Seth is an application engineer at The Mathworks in Natick, Mass.

1999

Andrea Calvo and Borys Gojnycz were married in Massachusetts on Sept. 3, 2005. They honeymooned on the beautiful island of Aruba and now live in Duxbury, Mass.

Cynthia Drainville married Christopher McCarthy on Sept. 18, 2004, with her sister **Katherine Drainville-Higgins '97** as honor attendant. Cynthia works for Cubist Pharmaceuticals; the couple lives in Attleboro, Mass.

Erin (Duffy) Nesbitt and her husband, Jamie, are pleased to announce the birth of their first child, Ann Elizabeth, on Sept. 9, 2005. They live in Hopewell Junction, N.Y.

Justin Ripley received his juris doctor from Franklin Pierce Law Center in May. He plans to specialize in intellectual property.

Jennifer (Reese) Smith volunteers as the Albany, N.Y., regional coordinator for the Future City Club, a national program that inspires budding engineers to design a model city and compete with other regions. She works for Plug Power as a chemical engineer.

2000

Christopher Boumenot married Stacy Gallagher on April 21, 2005. After their wedding and honeymoon in Eleuthera, Bahamas, they live in Westminster, Mass., where Chris works for Stratus Technologies.

Sheela Devarakonda received her doctor of veterinary medicine degree from Tufts last spring and joined the staff of the Ashland (Mass.) Animal Hospital.

Jennifer Marinello married **Joshua Parks '01** Oct. 9, 2004, on Cape Cod. She is currently teaching Spanish in Cherry Hill, N.J., and working on an M.Ed. degree in school leadership at Wilmington College.

Marybeth Miskovic earned her doctor of veterinary medicine degree at Tufts in 2003.

After completing an internship at an equine referral hospital in New Hampshire, she is currently a resident in large animal medicine at Purdue University School of Veterinary Medicine.

Robin Zack received her doctor of veterinary medicine degree from Ohio State University. She is part of a private practice based in East Liverpool, Ohio, which serves exclusively equine patients in and around Mountaineer Park.

2001

Kenny Antos received an MBA from the University of Connecticut last May, and went to work as business developer for the Massachusetts-based brokerage firm MortgageOpia.

Sara Briggs and **Ravi Misra '00** were married Sept. 3, 2005, with **Kellie (Martin) Bresnahan** as matron of honor, and **Emar Tongol '00** as a groomsman. The couple lives in Burlington, Vt.

Matthew and **Brooke (LeClair) Daniels** announce the birth of their first child, Sophia Claire, on May 30, 2005. The whole family is doing well, they write, from their home in Waltham, Mass.

Keith Desimone married Kristy Engdahl recently. He is a manufacturing engineer with Wyman-Gordon Co. in Grafton, Mass.

Aimee Kazlowski married Eric Kellstrand on Oct. 30, 2004. Bridesmaids **Jenn Brandl** and **Jen Waite** helped make the day special. After two wonderful weeks in Hawaii, Aimee is back to work at Fidelity Investments in Boston.

Megan Parsons received a master of public health degree from Boston University in May and is now a certified nurse-midwife. She recently accepted a job at Baystate Medical Center and resides in Salem, Mass., with **Andrew Cook '00**.

While vacationing in Aruba, **Michael Quigley** proposed to his girlfriend, Jennifer Grimes (Stonehill College '01). A wedding is planned for next summer.

2002

Rachel Bowers and **David Yamartino** were married on Sept. 10, 2005. The bridal party included **Toni Colognesi**, **Melissa St. Hilaire**, **Joseph O'Boyle**, **Samantha O'Connor**, **Nicholas Zuk**, and **Michael Tuxbury '00**. **Elizabeth Schweinsberg '00** also participated in the ceremony.

Mongolia to Moscow—by Train

Anne-Marie Chouinard '02 rode the Trans-Siberian Railway (see p. 48) starting from Ulaan Bator, the Mongolian capital. "My favorite part of the trip was sharing stories with others on board, using my Mongolian phrasebook and a lot of hand gestures and body language. Even with this rudimentary communication style I was able to learn a lot about them. My cabin mate, Sara, was a Mongolian entrepreneur who bought goods in Beijing and hawked pocketbooks, children's clothing, track suits, and blankets at every stop along the way (photo below). This meant commandeering one of the only two doors of the train car and shouting, 'Soomka, Soomka,' which is Russian for pocketbook. People would flock over and pay 100 rubles to have their very own.

"When we reached Moscow on the fifth day, I was quite excited to hear Russian and see the Cyrillic script on billboards and the western architecture. That night, as I walked across Red Square, I could feel the energy radiating from the people, as many different languages flooded my ears. It was quite the adventure and I wouldn't trade it for anything."



Jennifer Kaska married **Ryan Fournier '00** ('04 MBA) on June 18, 2005. They live in Milford, Mass., where Jennifer works for Waters Corp.

James Koniers and **Sarah Bellfy '04** were married July 23, 2005. Sarah has started veterinary school at the University of Pennsylvania, and Jim works as a design engineer at Hutchinson Industries in Trenton, N.J.

Sai Yeung Lee is a telecom engineer at National Grid in Westborough, Mass.

Shauna Malone and **Kurt Onofrey '04** were married on Aug. 5, 2005. After a honeymoon in Riviera Maya, Mexico, they went back to work for the Massachusetts Department of Public Health at the State Laboratory Institute in Jamaica Plain. Kurt is a quality control analyst for the Biologics Laboratories, and Shauna recently started a new job in the Bureau of Communicable Disease Control.

2003

Amy Bliven married Dennis Siewert on July 2, 2005. The wedding party included **Elliot Field**, **Elizabeth Levandowsky**, and **Chris Nichols '99**. Many other alumni were in attendance. After a honeymoon in Negril, Jamaica, the couple lives in Kissimmee, Fla.

Abiche Dewilde and **Berk Akinci** were married Aug. 7, 2005, with **Shannon (Hoosick) Cornwell** as maid of honor,

Kevin Cornwell '02 as best man, and **Tim Fisher '02** as a groomsman. The couple lives in Lowell, Mass.

Jeffrey Gladu joined K and M Electronics in West Springfield, Mass., as an electronics technician. He previously worked for Nidec Corp.

Lawrence Morris enlisted in the Marines under the Delayed Entry Program. He reported for active duty to undergo basic training at the Marine Corps' Recruit Depot in Parris Island, S.C.

Natalie Woodworth and **Dan Reed** got engaged in November 2004 in Higgins House gardens. They were married on July 22, 2005, atop Cadillac Mountain in Acadia National Park in Maine.

2004

John Lee Baird is pursuing an M.Sc. at Yale's School of Public Health. He is a contributor to "Language Learning Games and Activities," part of an official curriculum for teaching English as a second language published by Hess Educational Organization in Taiwan. His work included classroom adaptations of games like "Space Invaders" and creative writing activities, such as the "Create a Comic Project."

Stephanie Morin is pursuing a medical degree at the University of Connecticut School of Medicine in Farmington.

David Prickett (M.S.EE) recently passed his P.E. licensing exam in Massachusetts. He has been with Tighe & Bond since 2000, and is designing several wastewater management projects. He lives in Longmeadow, Mass.

Graduate Management Programs

Donald Lundstrom '78 (M.S. MGT) passed the Massachusetts Real Estate Salesperson exam and has patented designs for furniture designed for college dorms. He previously worked for Tyco Safety Products.

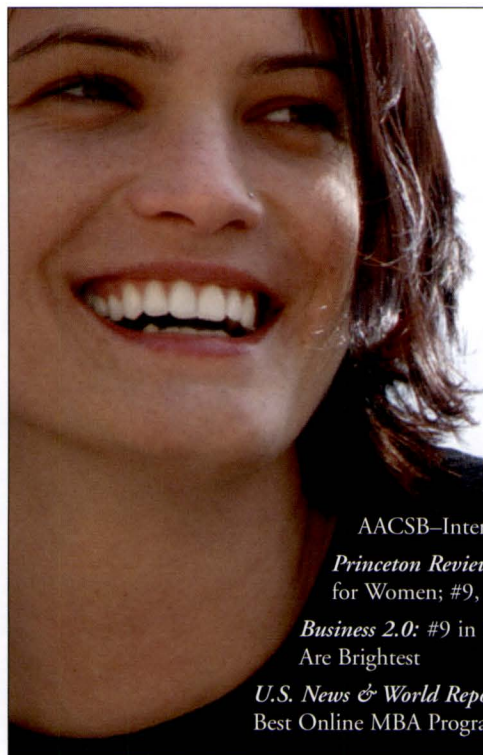
Andrew Boisvert '00 (MBA) joined SatCon Electronics as director of quality at the company's Marlborough, Mass., business unit.

Carol Bell '02 (MBA) was appointed director, materials management, for Thermalcast LLC.

School of Industrial Management

George Walker '58 of Clarksdale, Miss., was re-elected chair of the State Board for Community and Junior Colleges. The founder of Delta Wire Corp., he has served on numerous economic and educational councils.

Ted Bauer '84 joined Thermalcast, LCC as director of sales and marketing.



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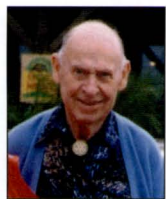


WPI

For more information
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Obituaries

Corrections:



The Summer issue of *Transformations* noted the passing of **Al Demont '31** on July 28, 2005. Due to a layout error, his obituary appeared under the class heading for the 1960s.



The obituary of **Carl Giese '43** included the wrong photograph. Here is his graduation photo.

Our apologies to the families of both alumni.

1930s

Yearbook editor **H. Edwin Hosmer '31** (Alpha Tau Omega) died April 7, 2005. A longtime resident of Concord, N.H., he leaves his wife, Mary (Orlandi), and a son. Hosmer worked for Monsanto Chemical, where he was part of a four-person team that developed safety glass for automobiles.

Arthur E. Glow '33 of Pepperell, Mass., died May 14, 2005. Predeceased by his wife, Margaret (Lorden), in 1981, he leaves three children. A retired plant engineer for Bemis Co., he held several patents on the manufacture of paper bags.

Transformations recently learned of the death of **George Kalista '34** (Theta Chi, Skull) in 2002. He was a missile expert who worked at Earle Naval Weapons station. Predeceased by his wife, Effie Schwartz-Kalista, he is survived by a daughter.

Phillip S. Dean '35 (Lambda Chi Alpha) of Rocky Hill, Conn., died May 16, 2005. He worked for CL&P and Northeast Utilities, retiring in 1976. Predeceased by his wife, Doris (Lyon), he leaves a son.

Raymond F. Starrett '35 (Phi Gamma Delta, Skull) of Ormond Beach, Fla., died May 5, 2005. A highlight of his 40-year career with the L. S. Starrett Co. was the start up of the company's operations in Jedburgh, Scotland. Starrett was predeceased by his first wife, Eunice (Brown), his second wife, Barbara (Carrier), and his third wife, Clara (Whyte). He leaves two sons and a daughter.



Hewitt E. Wilson '36 (Theta Chi) of Bowling Green, Ky., died April 23, 2005, leaving his wife, Maude (Wilson), and two daughters. He was co-owner of C. E. Wilson

Nurseries.



Paul R. Glazier '37 (Theta Chi) of Torrington, Conn., died May 15, 2005. He was a longtime employee of The Torrington Company. Predeceased by his wife, Marjorie (Lipe),

he leaves two daughters.



Robert S. Rich '37, widely known as "Rich," died April 26, 2005, at his home in Miami. He was the founder of Rich Electronics, specializing in marine equipment. His wife, Sarah, and three children survive him.



Neil A. Fitzgerald '38 (Sigma Alpha Epsilon) of Irvine, Calif., died Aug. 8, 2005, leaving his wife, Ann (Jasinick), and two children. He began his career as an oil field

roustabout, and later became a developer. For 65 years, Fitzgerald worked for Union Development Co., where he managed the construction and maintenance of housing developments and commercial real estate in Southern California.



Donald L. Fogg '39 of Holden, Mass., died Feb. 21, 2005. Predeceased by his wife, Ethel, he leaves five children. Fogg was retired from Norton Co. as a manu-

facturing engineer.

Transformations recently learned of the death of **Robert C. Murphy '39** (Phi Kappa Theta) in 1996. He was a retired self-employed engineer.

1940s

Leonard Goldsmith '40 (Alpha Epsilon Pi) of Tacoma, Wash., died May 28, 2005. An aerospace engineer, he was retired from Singer Co. as a program manager. Survivors include his wife, Marcia (Skeist), and two sons.

Judson D. Lowd '40 (Theta Chi) of Tulsa, Okla., died May 6, 2005. After a 40-year career in the oil and natural gas industry, he retired as president of the Product and Services Division of Combustion Engineering Inc. He later established a business management consulting firm. Lowd was predeceased by his wife, Alice (Carroll), and a stepdaughter. He is survived by a daughter and a stepdaughter.

Marcus A. Rhodes Jr. '40 (Theta Chi) of Taunton, Mass., died May 8, 2005. A co-owner of M. M. Rhodes and Sons, he served as assistant manager and treasurer. Survivors include his wife, Dorothy, and four children.



Francis E. Stone '40 of Swanzy Center, N.H., died June 24, 2005. He was retired from the A. C. Lawrence Leather Co. as a development engineer. He is survived by his wife,

Mary, and four children.



Hector L. Cameron '41 (Phi Gamma Delta) of Petersham, Mass., died July 29, 2005. He was a self-employed industrial engineer and labor arbitrator. Predeceased by his wife, Carolyn (French), he leaves six children.

Norman C. Morrison '41 of Rochester, Minn., died Feb. 11, 2005. He was retired from Federated Mutual Insurance Group as group underwriting manager. Survivors include his wife, Betty, four children, and three step-children. He was predeceased by his first wife, Mildred (Perkins), and his second wife, Margaret (Wing).



Paul G. Nystrom '41 of Fairfax, Va., died June 1, 2005. He leaves his wife, Margaret, and three sons. Nystrom worked for American Risk Management and retired as director, Washington contracts.

Alexander Mikulich Jr. '42 of West Palm Beach, Fla., died May 11, 2005, leaving his wife, Joanne (Hurley), and three children. A graduate of Harvard Business School, he also held a master's degree in mechanical engineering from Yale University. He was the owner of several automobile dealerships in New York and New England.

John H. Jacoby '45 (Theta Chi) of New Hampton, N.H., died Oct. 7, 2004. His wife, Ann, survives him. Jacoby was president and treasurer of PIN-FIN Inc.

John B. McMaster '45 (Theta Chi) of Vancleave, Miss., died Feb. 4, 2005, leaving his wife, Ruth. He was retired from Chevron Corp.

Robert E. Scott '45 (Phi Gamma Delta, Skull) of Moorestown, N.J., died June 30, 2005. Survivors include his wife, Miriam (Weest), and four children. Scott's career in industrial and commercial insurance included nine years based in London with FM Global, and many years in the New England area.

John A. Templeton '45 (Sigma Alpha Epsilon) of Redlands, Calif., died March 11, 2005. He leaves his wife, Marjorie, and four children. Templeton was retired from TRW Inc. as advanced systems manager.

Joseph F. Pofit '46 (Phi Gamma Delta) of Medford, Mass., died Aug. 12, 2005. His wife, Ruth (Tamalavage) died in 1987. Four sons survive him. Pofit worked as a mechanical engineer for Rockwood Sprinkler Co. and retired from Crane Co. in 1986.

Eugene R. Ritter '46 of Toledo, Ohio, died June 9, 2005, leaving his wife, Verna "Jeanne" (Cupp), and four children. He worked for Allied Chemical for more than 30 years and later retired from St. Charles Mercy Hospital as director of plant operations.

Harry L. Hoffee '47 of The Plains, Ohio, died June 20, 2005, after suffering a major stroke the year before. Predeceased by his wife, Beulah (Calvin), he is survived by two children. Hoffee earned a master's degree in electrical engineering at Ohio University. He joined the faculty as an instructor and retired as professor emeritus in 1979, after serving as chairman of the Electrical Engineering Department and assistant dean of the College of Engineering and Technology.



Henry G. Mogensen Jr. '49 (Phi Sigma Kappa) of Vero Beach, Fla., died April 8, 2005. He leaves his wife, Beverly, and two children. A mechanical engineer, he was the retired president of Mogensen Enterprises.



Edward J. Simakauskas '49 of Spencer, Mass., died July 11, 2005. He was the husband of Aldona (Yablonski), who died in 1998, and the father of Alan E.

Simakauskas '78, who survives, along with six other children. Simakauskas retired from U.S. Steel in 1979, after 27 years as a product engineer.

1950s

John F. Gallagher '50 (Phi Kappa Theta) died recently at his home in Worcester. A civil engineer, Gallagher spent 42 years with the Massachusetts Highway Dept. and retired as associate commissioner. He also taught hydraulics as a professor at Worcester Junior College. Predeceased by his first wife, Mary (O'Neill), he leaves his wife, Lillian (Wood), and six children.



Charles P. Gure '50 (Sigma Alpha Epsilon) of Westborough, Mass., died May 10, 2005. He leaves his wife, Margaret (Concaugh), and two daughters. Gure earned a master's degree in mechanical engineering from Columbia University and worked for Wyman-Gordon Co. for 30 years.

George E. Edwards '50 (Sigma Alpha Epsilon) of Hillsbough, N.H., died Aug. 17, 2005. His wife, Ellen, survives him. He was retired as founder and president of E. H. Edwards & Son construction company.



Transformations recently learned of the death of **Calvin D. Greenwood '51** (Sigma Phi Epsilon) of Peterborough, N.H., in 2003. A former project engineer for Pratt & Whitney Aircraft, he leaves his wife, Ruth.

Richard T. Gates '52 (Sigma Alpha Epsilon) of Brattleboro, Vt., died June 27, 2005. He was the former owner and operator of Gates Insurance Co. Survivors include two sons, and his former wife and close friend, Joy Lawton.

George A. Garrison '53 (SIM) (Theta Chi), president of the charter class of the School of Industrial Engineering, and a former president of Tech Old Timers, died June 5, 2005, at his home in Worcester. He was 83. He leaves his wife, Nancy (MacGilpin), and four children. A World War II veteran, Garrison served 27 years in the U.S. Army Reserves and retired from Norton Co. in 1973 as general purchasing agent. He later served as vice president of Anderson Corp.



John P. Morrill '53 (Sigma Alpha Epsilon) of Morehead City, N.C., died Sept. 30, 2004. He was retired from B.F. Goodrich Chemical Co. as technical service

manager. He also owned an antiques business with his wife, Joan, who survives him, along with two sons.



Donald W. Smith '54 (Lambda Chi Alpha) of Hollis, N.H., died April 30, 2005. He was the retired chief engineer for Fletcher Quarry. Survivors include his wife, Mary Anne (Johnson), and a son.

Harold K. Vickery '54 (SIM) of Gloucester, Mass., died May 7, 2005. He leaves his wife, Bess (Pazeian), and three children. Vickery attended WPI for his freshman year, starting in 1931, and later returned to earn a certificate from the School of Industrial Management. He was a retired senior industrial engineer at Norton Co.

Alan F. Petit '55 (Phi Gamma Delta) of Gaithersburg, Md., died June 9, 2005. He was retired from the federal government as a member of the Technical Security Staff. He is survived by cousins and a nephew

Edward P. Simonian '55 of Ferndale, Wash., died Aug. 7, 2005. A longtime employee of Puget Sound Power and Light Co., he went into the motel business after retirement. Survivors include two sisters, nephews, and nieces.

Gerald T. Dyer '56 (Phi Sigma Kappa) of Princeton, Mass., died July 17, 2005. He leaves his wife, Diane (DeSimone), and three daughters. He was retired from Bayer AG Chemical Co.

Ralph M. "Sandy" Johnson '57 (Sigma Phi Epsilon) of Carver, Mass., died May 29, 2005. A construction project supervisor for Perini Corp., he oversaw the construction of the Ronald Reagan Building and International Trade Center, currently the largest building in Washington, D.C. Survivors include his wife, Anita (Silva), and two sons.

Edward M. Keith '57 (SIM) of Grafton, Mass., died Feb. 17, 2005. He leaves his wife, Phyllis (Simon), and two sons. Keith was retired from New England Power Co. as vice president and director of thermal production.

Transformations recently learned of the death of **George B. Lynch '57** ('71 SIM) in 2002, at age 87. He was retired from American Optical Co. His wife, Gwendolyn, survives him.

James B. Burke '59 (Theta Kappa Epsilon) died Aug. 4, 2005, in Glastonbury, Conn. He leaves his wife, Jacquelyn (Smith), and four children. He was retired from Pratt & Whitney.

1960s

James J. Kaput '64 of North Dartmouth, Mass., died July 30, 2005, from head injuries sustained when he was hit by a pick-up truck while jogging. A professor of mathematics at the University of Massachusetts Dartmouth for 25 years, he was an advocate for expanding mathematics education beyond mechanical calculation and memorization. Under grants he received from the National Science Foundation, he developed software to use arcade games and hand-held devices as teaching tools. Survivors include his wife, Susan, and three children.

James C. Ward Jr. '64 of Avon, Conn., died May 2, 2005. Survivors include his wife, Sheila (Ryan), a daughter, and a son. Ward joined Hartford Electric Light Co. as a cadet engineer after graduation and retired from Northeast Utilities in 2004 as manager of cogeneration.

Robert D. Schlee '65 of San Jose, Calif., died Oct. 15, 2004. He was retired from IBM Corp.

Thomas J. Ford '68 of Waldoboro, Maine, died March 16, 2005, leaving his wife, Wendy, and three children. He was a physics teacher at Gould Academy and later worked in product development at The Science Source.

1980s

Edward J. McKay III '85 of Greenfield, Mass., died March 11, 2004, at age 60. He was self-employed as an alternative energy engineer and a designer of electronic music equipment. He also served as a real estate appraiser and assessor for area towns. Survivors include a sister and several cousins.

Carla's Champions

was established to create a legacy for **Carla (Caputo) Moddero '96** through fund-raising for cancer treatment, education and research, and public awareness

on issues faced by blood cancer patients and their families—and to help ensure that other children will not grow up without a parent

because of these diseases. For more about its mission and activities, visit carlaschampions.com.



Letters

Continued from page 3

improvement of performance through research and development. Leslie J. Hooper '24, who succeeded Allen as director of the laboratory, conducted field trials using the salt velocity method at hydroelectric sites throughout the world. Both "Hoop" and Lawrence C. (Larry) Neale '40, the next director, utilized model studies to help design and optimize a large number of hydroelectric installations and hydroelectric equipment. Recent work at the laboratory has resulted in the patented invention of a turbine that minimizes injury to aquatic life.

Traveling in New England, it is easy to see that the water power potential available at most old mill sites is unused. While it was once difficult to gain the rights to access sites for water power development and to sell electric power to utilities, it is now possible to do so. William K. Fay '82 (M.S.) saw that the myriad abandoned mill sites provided opportunity for low-head hydroelectric generation. As a graduate student working at WPI's Alden Research Laboratory, he

conducted research to improve the performance of low-head turbines. He formed the French River Land Company to acquire rights, refurbish and improve generating equipment, and produce hydroelectric power. French River (www.frenchriverland.com) is a family-owned company—Bill's daughter Celeste N. Fay '07 serves as president, and his son William D. B. Fay '09 is vice president. Altogether, Bill has consulted on more than 70 hydroelectric projects. French River itself has rehabilitated 16 hydroelectric sites, including Slater Mill in Pawtucket, R.I., and Sturbridge Village in Sturbridge, Mass. They presently operate five sites producing more than 1 megawatt of electric power and are in the process of planning for two more sites with an additional 1 megawatt of capacity.

Capturing the renewable energy supply in streams and rivers will surely become much more important as other energy sources become more costly. WPI can rightly claim both vision and action in developing hydropower today, as it did yesterday.

William W. Durgin

WPI Associate Provost and Vice President for Research



Time Capsule

By Michael W. Dorsey



Maintaining a Lifeline

In the fall of 1917, as World War I raged, the Bolsheviks seized control of Petrograd, the Russian capital, taking a major step toward the creation of a Communist Soviet state. Amid this turmoil, the fate of a 5,772-mile-long rail line, the longest uninterrupted stretch of track in the world, took on enormous importance.



The Trans-Siberian Railway, extending from Moscow in the west to Vladivostok on the Pacific coast, was a vital conduit for supplies and troops headed to the Western Front. As the war reached its climactic moments and Russia hovered on the brink of civil war, keeping the railway operational became a strategic interest for the United States.

When President Woodrow Wilson learned that the line was barely functioning, he sent an advisory commission to inspect it. One member, William L. Darling, WPI Class of 1877, had earlier helped build the first transcontinental line across the northern United States. Wilson's stated purpose was keeping the railway operating, but historians say he was also interested in seeing the anti-democratic Bolsheviks fail.

The advisory board recommended major operational improvements, and Wilson created the Russian Railway Service Corps to implement them. Among the applicants was Benjamin O. Johnson, Class of 1900, a civil engineer who had risen through the ranks of the Northern Pacific to become a superintendent by the age of 39. "I never personally wanted anything in my life as badly as I want this opportunity," Johnson wrote to his superiors, asking to be given leave to travel to Siberia.

Commissioned a major in the new unit, Johnson sailed for Vladivostok on Nov. 19, 1917, with more than 200 other RRSC officers and 75 machinists. Over the next five years, he played a pivotal role in the work of the Corps, which kept the railway working despite constant dangers posed by increasingly bitter warfare between the Bolsheviks and counterrevolutionary forces.

For many months, Johnson was preoccupied with efforts to evacuate the Czechoslovakian Legion, a hardened band of Czech and

Slovak prisoners of war and deserters from the Austro-Hungarian army eager to return to the fight. The Bolsheviks first granted them free passage to Vladivostok, but after signing a peace treaty with the Central Powers, reneged, fearing the legion would join the counter-revolutionary forces. The legion's subsequent revolt led President Wilson to send American troops to Siberia. Johnson helped lead the legion out of the country and took charge of rebuilding tracks and bridges destroyed by the Bolsheviks. In November 1918, he became the only American to receive the Czechoslovakian War Cross during World War I.

In 1919, the Inter-Allied Railway Commission was established to supervise the railway. Johnson twice served as acting president of the IARC's Technical Board, which managed the line's technical and economic aspects. In the fall of 1919, after significant setbacks for the counterrevolutionaries, Johnson took charge of managing their retreat by train. Later, as the country fell further into chaos and as typhoid and smallpox broke out among the troops, Johnson took charge of the evacuation out of Siberia and was on the last train out of Omsk, just a day before the Bolsheviks occupied it. In a letter, Johnson described the scene in the city: "twenty below, confusion, and the most extreme case of madhouse that a person can imagine." Families froze on the platform waiting for trains, he wrote. Everywhere he looked he saw "the haunting, unpleasant look of panic on everyone's faces."

In 1920, Johnson was promoted to colonel and named commanding officer of the RRSC and chief inspector for the Trans-Siberian and Chinese Eastern railways. He was also responsible for the continuing efforts to get the last Allied troops to Vladivostok and onto ships for home.

Before departing Russia in 1922, Johnson received the Chevalier of the National Order of the Legion of Honor from France for his courage in helping evacuate French troops. Japan and China also decorated him for his work as acting Technical Board president. Back home in Montana, he resumed his job as a railroad executive.

In 1923, Johnson returned to WPI, where he was given the honor of speaking at Commencement. But when the Institute later asked him to become its president, he wrote that he was a "railroad man, not a college man." On a return trip to Russia in 1930, the government asked him to head its railway system, but Johnson turned down that offer, too, due to failing health. He died in 1932 at the age of 54.

Johnson had hoped the work of the RRSC would be remembered fondly in Russia, but the organization and the U.S. intervention came to be viewed as evidence of America's imperialist and anti-Bolshevik intentions. Historians agree that the work of Johnson and the other railway men who helped rebuild the Trans-Siberian Railway probably contributed to the advent of a rift between the Soviet and American governments that lasted through much of the twentieth century.

Editor's Note: Almost one century after Johnson worked on the Trans-Siberian Railway, WPI alumna Anne-Marie Chouinard '02 traveled along the same stretch of track. See page 43.

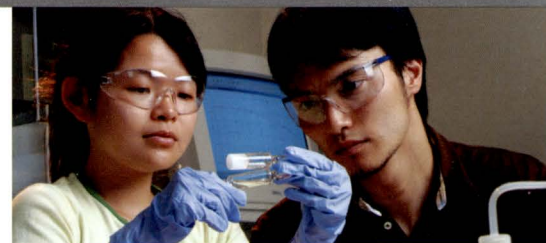
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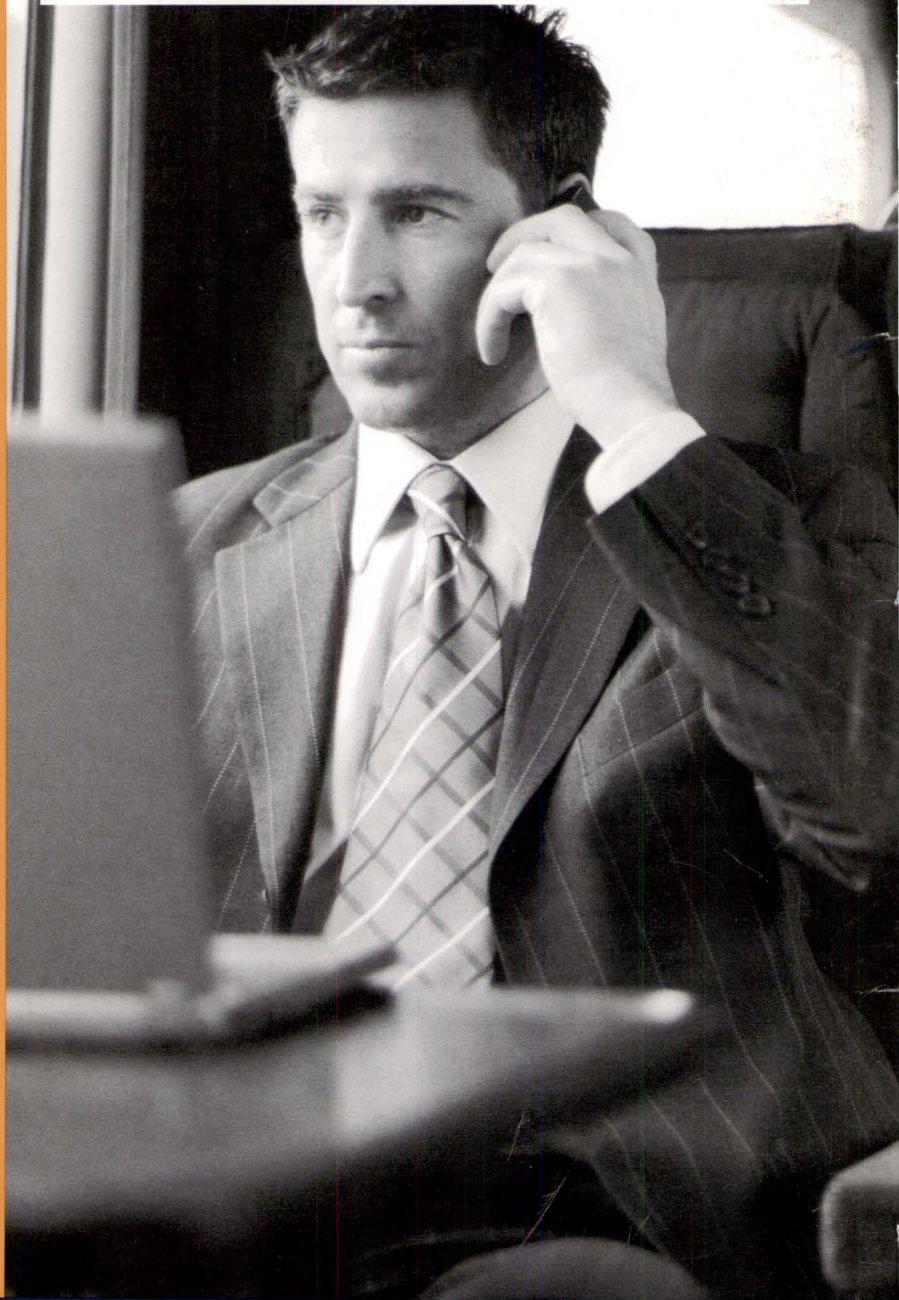
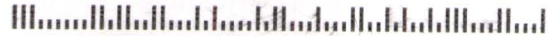
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