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*Site not confirmed at press time

Albany, N.Y.
Heffner Alumni House
Lisa LaCroix '89
(518) 276-2737

Atlanta, Ga.
Stooge's Sports Bar & Restaurant
Jack Wexler '85
(404) 264-9738

Baltimore, Md.
Thomas Brudzinski '68
(301) 381-1263

Boston, Mass.
The Home Plate
Ed Hastings '84
(508) 562-6994

Buffalo, N.Y.
American Sports Bar & Grille, Ramada Inn
Scott Smith '79
(716) 773-5302

Burlington, Vt.
Bambino's Sports Bar & Restaurant
Sherry & Rob Silver '86
(802) 660-8284
Charles Masenas '82
(802) 769-6262

Charlotte, N.C.
Terry Jordan '72
(704) 543-8140

Chicago, Ill.
Steve Soucar '79
(708) 844-1122

Cincinnati, Ohio
Willie's Sports Bar
Robert Staley '56
(513) 821-4081

Dallas, Texas
Ultimate Sports Grille
Peter McCormick '80
(214) 696-6737

Denver, Colo.
Jackson's Hole
Ralph Crandell '51
(303) 752-1458

Detroit, Mich.
Terry Seyler '65
(313) 822-2392

Hartford, Conn.
The Main Pub
Angela Campisi '83
(203) 561-1410

Houston, Texas
Deborah Schmutter '82
(713) 781-4851

Long Island, N.Y.
Gary's Place
Joseph Hoose '89
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Los Angeles, Calif.
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Lisa LaCroix '89
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Norfolk, Va.
Legends
David Malsbury '83
(804) 545-4915

Northern New Jersey
Phil Lurie '74
(201) 444-2140

Orange County, Calif.
Legends
Dick Baynes '50
(714) 552-3889

Orlando, Fla.
Tom Rippere '75
(407) 295-9248

Pittsburgh, Pa.
Clark Bar & Grill
Ed Rosenstein '76
(412) 492-9758

Puerto Rico
Hector Mayol '72
(809) 748-9797

Raleigh, N.C.
Champions Sports Bar
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Brent Williams '83
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Steve Muelhern '87
(716) 232-5135

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San Jose Live
Andy Daniel '81
(408) 268-3114

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Univ. Sports Bar and Grill
Chris Stafford '91
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See the Big Red Freakout via Satellite

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IN THIS ISSUE

2
PRESIDENT’S VIEW

3
LETTERS

5
HOLLYWOOD ON THE HUDSON
Movie director Martin Scorsese turns his cameras on Troy.

6
KALEIDOSCOPE

14
BUILDING FASHION
Architect grad Steve Fabrikant ’75.

18
COMMUNICATING SUCCESS
Entrepreneur of the Year Paul Severino ’69 makes computers talk to one another.

24
LOOK MA, HANDS ON!
Rensselaer’s popular undergraduate research program teams students with faculty for hands-on research.

28
ALUMNI NEWS
Fall Alumni Weekend ’93

30
CLASS NOTES

46
IN MEMORIAM

48
THE LAST WORD
Rensselaer’s Mark Rice ’71 on fostering entrepreneurship through business incubators.

Undergraduate Research Program participant Tim Myers ’94. For more on the program, see page 24.

COVER PHOTO BY MARK MCCARTY
How Rensselaer Stands Apart

A n interviewer recently asked me what differentiates Rensselaer from its many competitors. The answer was easy. Rensselaer gives its students unparalleled opportunities for discovery, for creativity, and for leadership.

I believe that dedication to these three characteristics, above all else, is the mark of a great university. Discovery, creativity, and leadership are the lifeblood of true learning, the soul of higher education. Without them there can be training, even expertise, but never full mastery. And most important, without them there can be little joy in learning or living.

Discovery, creativity, and leadership are also essential ingredients of success beyond the university. I have been privileged to meet many of Rensselaer's distinguished alumni and I have been extraordinarily impressed with the level and the variety of your successes.

Four times a year Rensse­laer magazine heralds your accomplishments. This issue is no exception. Here you will read about Steve Fabrikant '75, a Rensselaer architecture alumnus whose creative energy has propelled him to the top of the nation's fashion industry. On the cover is Paul Severino '69, an engineering and entrepreneurial wizard whose communications firm has been named America's fastest growing company by Fortune magazine for two years in a row. Here, too, is an article about one of Rensselaer's proudest assets, a program that sets us far apart from our competitors—the Undergraduate Research Program.

What may not be immediately obvious is that these very different stories are all alike in one respect. They exemplify those three distinguishing characteristics—discovery, creativity, and leadership—that make Rensselaer a great university.

Our seal is proudly inscribed with two words that are certainly engraved in your memory. These words—knowledge and thoroughness—symbolize the rigor that has always been the foundation of a Rensselaer education. Our future reputation will be built on that foundation.

We will always challenge our students with rigorous programs to stretch their minds and broaden their horizons. To do less would be to disadvantage them and dishonor our heritage. But in honoring our heritage, we must focus on the future. The world is vastly different from what it was in 1824. Stephen Van Rensselaer would not recognize the Institute and its students today. Or would he? The fundamental characteristics of our students remain unchanged: they are still highly motivated, inventive, and successful. And the Institute is still preparing them to transform the world through the “application of science and technology to the common purposes of life.”

Our basic character and our mission have not changed. But how we carry out that mission must evolve to meet the changing needs of our society. Our understanding of rigor—of what knowledge and thoroughness should mean today—must become broader and deeper if we are to remain a great university.

Our challenge today is to make the Rensselaer experience one that nurtures the whole student through creativity, discovery, and leadership. We must ensure that the bright and inventive young men and women who enter Rensselaer have every conceivable opportunity to grow, expand, and flourish.

It is our responsibility, and our privilege, to give our students the intellectual and social “nutrients” they will need to discover and develop themselves, their talents, and their unique strengths. To provide them with a culture that encourages them to explore the world in its vast and awesome complexity. To give them the opportunities and the skills to create the perfect algorithm, the elegant bridge, the life-saving procedure. And to send them into the world with the leadership and team-building experiences they will need to succeed.

When we do all that, we will have truly succeeded in honoring our heritage and fulfilling our mission. We will have endowed our students with the lifeblood of true learning and sustained Rensselaer's unique position in the world.
Hey, That's My Statue!
The alumni magazine keeps us posted as to what RPI is doing and has done—it's great.
You used a photo of my sculpture of Uncle Sam [June 1993] and did not give credit to its creator: an emeritus professor of the School of Architecture of 12 years duration; during which I made the monument for the people of Troy. I was one of five sculptors competing for the honor.
To publish reproductions of art without the creator's name is a form of discourtesy—I'm sorry it took place in the alumni magazine.
K. George Kratina
Old Chatham, N.Y.

[We are sorry for the oversight. Uncle Sam is an important part of Troy's heritage, and your sculpture pays him fitting tribute.]

Politically Speaking
I was quite disturbed to read your feature article on John Olver, representing the 1st congressional district in Massachusetts, in your March 1993 issue.
When I graduated from Rensselaer, I strived to excel in engineering and as an entrepreneur. The likes of Olver have driven me into what is now a second career in politics. The freedoms we enjoy as engineers are more at stake than many realize.
The Olvers in government are increasing restrictions on design creativity (dealt with the FDA recently?) and entrepreneurship through abusive regulations, taxation, and changes in the patent process. To them, the private sector is a necessary evil that must be regulated and stifled.
The pursuit of freedom, in all its forms, is what made America great. Let's not turn back the clock to a time of government by oppression. Let's defeat John Olver and all the Olvers from the White House to the City Council who threaten our freedom in the name of democracy.
Barry Cowen '86
Chairman, Waltham, Mass., Republican City Committee

Rooms With a View
The Rensselaer alumni magazine came the other day, and, as usual each time it arrives, I stop everything and go back in time to the years between 1927 when we moved to Troy to live next door to the Hakes Family on Tibbitts Avenue and 1940 when I married Howard Hodge '38 and moved to Pennsylvania.
There may be a few of the boys (you will all stay boys in my mind) who remember those two boarding houses a few blocks from the RPI dorms. I hope so. Boarding houses played a big part in college life in that span of time.
Aunt Bessie Hakes had built her house several years before Mother, so she had a head start when the boys from RPI came knocking on her door, asking if she had rooms to rent. Mother decided a boarding house would answer her need to earn money and still be at home to take care of the three of us (Marion, Roberta, and me) and Aunt Bessie told her there was always an overflow of students looking for a nice place to room.
Our house was built next door, and for the next 20 years or so, we grew up having the run of two houses and unlimited company.
We three girls wandered through either house, getting to know the boys who missed their families, and, until we grew old enough to be interesting, just being a nuisance. We learned to think fast on our feet in order to hold our own with others who treated us the way they probably treated their younger sisters. They went with the whole family on picnics with us, were in on family parties if they wanted to be, sorrowed with us if someone died, and asked for sympathy or advice when they had the need.
In those earliest days, people made their own fun. There was always a jigsaw puzzle on a card table, waiting for anyone who passed to stop and add a piece. We played Monopoly so often I have never been able to enjoy it since. We made our own magic lanterns for cardboard boxes and showed pictures with old postcards or magazine cutouts. We read and we talked. There was always talk.
Both houses were alive with music much of the time, thanks to the pianos in the living room, and somehow, there was always something someone who could bang out the latest tunes.
From all this, it sounds as if RPI was four years of nothing but fun and games. Not so. Those boys worked hard, studying for hours, and the recreation was well earned.
As I look back, and compare the way things were with the way they are now, I feel pretty fortunate to have grown up in those two houses with that succession of boys coming and going. I like to think both Mother and Aunt Bessie contributed something rare to their years at RPI, and I am sorry that era is gone.
Since I began this I have been remembering the many boys who were special to us. I almost hate to mention any for fear of forgetting someone who should be on the list, so I'll name three besides How. The first is Reg Male '44, who married Roberta. They live about half an hour from me, here in Virginia. The other two are gone now. Truman Follett '41, who lived both with us and Aunt Bessie, and became part of the family, and Carson Small '39, one of How's best friends. It was Carson's name in the obituaries that got this long letter started.
I wish you all well. It was fun growing up with you.
Kathryn McClellan Hodge
Mt. Crawford, Va.

Gay Rights
I am a class of 1984 Nuclear Engineering graduate who will shortly obtain a Ph.D. from MIT; and I am very grateful for and proud of the fact that Rensselaer

Continued on page 4
Continued from page 3

Margaret M. L. C. Knight

In the setting where it is those who do not have sons—G. Michael Dzarnan

siveness in society by Glastonbury, Conn. Rodolphe Smith Fouche

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call for witch hunts, dent and alumni groups

It seems to me that part of the problem stems from the fact that those who have taken this decision are not able to differentiate between the toleration of certain practices and accepting them as normal in society. In reality, rather than showing "compassion" for those who are different, it is a thinly veiled excuse to justify their own lifestyles and to propagate immorality and permissiveness in society by redefining as non-existent or "Victorian" (and therefore useless) the concepts of "right" and "wrong."

Gays and lesbians have the burden of showing that their demands can truly be considered rights. That is a fundamental requirement of civic harmony in radically pluralistic liberal democracies. It does not call for the suppression of the false opinions that others may still hold. It does not call for any social or political action enforcing unanimity in the adoption of the truth. It does not call for witch hunts,

McCarthy tactics, or the burning of heretics. It calls only for continued discussion between individuals and groups. The alternatives to making your case are only two: the manipulation of public opinion by propaganda and the use of coercive political power—exactly the tactics employed most often by homosexuals.

Gays are entitled or have a genuine right to civic toleration—that is the absence of harassment and unreasonable discrimination. But gays have no rights to Institute-backed (or government-backed, for that matter) acceptance and encouragement of their lifestyle.

My hope is that in the near future I will be able to make financial contributions to Rensselaer to help students achieve their highest potentials in an environment free from discrimination, and in a university setting where it is understood that toleration does not necessarily mean acceptance.


Perhaps John Russell ("Club Offensive to Reader" in the September 1993 issue) would moderate his tone a little if he were to have a daughter who is lesbian, as Marie and I do. Over the years since Kate came out we have learned a great deal about how hostile much of society is to so many fine young people—often intelligent, caring, gentle people.

Many have enrolled and will enroll at Rensselaer to embark on creative careers. Without support from student and alumni groups that Russell finds offensive, these students will often be deep in the "closet," feeling pressured to "live a lie" over who they really are. For this is not some whim, or rebellious "choice"—here is so much evidence, both anecdotal and from recent research, that their sexual orientation is largely if not totally determined before birth.

I am proud, along with many other RPI graduates who have gay or lesbian children, that Rensselaer does not join in the condemnation of our children. Russell's letter makes clear why gays have need of supportive organizations. They seek no special privileges, but only the right to be free of attacks which can compromise their freedoms. They seek freedom to study, to learn, to seek jobs that use their talents; these are the freedoms that have often been curtailed by those who do not have sons or daughters or good friends whom they have learned to care for regardless of their sexual orientation.

Robert L. Calvin '46 Glastonbury, Conn.

Correction: In the 1992-93 Report of Gifts that appeared in the September issue of Rensselaer, Dominick Costantino '33 (Founder's Club) and Richard E. Scammell '69 (Patron) were mistakenly omitted.

Rensselaer wants to hear from you. In order to provide space for as many letters as possible, we often must edit them for length. Please address correspondence to: Rensselaer, Office of News and Communications, Rensselaer Polytechnic Institute, Troy, NY 12180—or fax correspondence to us at (518) 276-6091.

Opinions expressed in these pages do not necessarily reflect the views of the editors or the policies of the Institute.

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Downtown’s River Street was transformed, with the help of tons of dirt and period signage, into 1870s Wall Street.

Hollywood. New York City. Troy?!

It may not have a nickname like “Tinseltown,” but Troy is beginning to make a name for itself in the world of filmmaking. In recent years, directors have turned their camera on the city for such films as The Bostonians, Ironweed, and Scent of a Woman. Following in their footsteps, director Martin Scorsese chose Troy to stand in for 19th-century New York City for his period drama, The Age of Innocence.

The film, based on Edith Wharton’s 1921 Pulitzer Prize-winning novel about the rigid morals of New York’s high society in 1870, has gotten reams of publicity and generally good reviews, mostly because of its precise portrayal of the highly gilded and fashionable times.

If you saw the film and felt a surge of familiarity at certain scenes, perhaps it’s because you may have walked on the same ground as stars Daniel Day-Lewis, Michelle Pfeiffer, and Winona Ryder.

Troy has the look Hollywood’s directors seek when they’re searching out locations for period movies. Its three-story brownstones and elegant facades line street after street downtown, providing the kind of uninterrupted horizon movie-makers require for exterior shots.

“Since the buildings on the street have remained unchanged since the turn of the century when Troy was a major business center, there were no new tall buildings in the horizon,” says Patricia Doherty, location manager for the film. “We couldn’t have built a better set.”

The Age of Innocence was filmed in several locations around Troy, including “The Castle,” home to Rensselaer fraternity Pi Kappa Phi; downtown’s River Street area; the Rice Building at First and River streets; and Washington Park.
Entrepreneurship Goes East

Rensselaer is helping the entrepreneurial spirit take hold in a country that formally adopted capitalism only a few short years ago.

Pier Abetti, professor of management and entrepreneurship at RPI, visited Ukraine in 1991 where he agreed to help start a business incubator at Kiev Polytechnic Institute. An incubator provides basic support, counseling, and advice to start-up companies housed within it.

Rensselaer trustee Warren Bruggeman '46 and his wife, Pauline, provided the seed money to get the Kiev incubator off the ground. Seven Ukrainians visited Rensselaer in August 1992 for training in running an incubator.

Andrew Dressel '84, co-founder of MapInfo, is serving as assistant director of the Kiev incubator, where he will consult for two years. John Chase, a Rensselaer MBA student, visited Kiev this past summer to relieve Dressel, who hadn’t been home since December 1992.

The program has also received additional support, in the form of a $152,000 grant from the U.S. Information Agency and two grants from the Academy of Engineering Sciences of Ukraine.

With this additional funding, classes were conducted this summer in both Kiev and Lviv. Sixty-five students were taught the basics of entrepreneurship. Comprehensive business plans were developed for the most promising ventures, and the top 15 to 20 students will attend a graduate-level class at Rensselaer next summer.

There are now three companies operating in the Kiev Incubator. An incubator has also been formed at the Lviv Polytechnic Institute in Western Ukraine. Mark Kapij '88, former president of CamSys, a Rensselaer incubator company, will be a consultant to the new director of the Lviv Incubator.

Rensselaer researchers have developed a high-speed 3-D microscope for the automatic prescreening of Pap smears. These smears, used for early detection of cervical cancer, are now screened manually. But it is a tedious, subjective process in which the false negative rate can be as high as 30 percent. If even one of the 50,000 to 500,000 cells on the slide is malignant, the smear should be tagged suspicious.

In an effort to speed the process and get better results, several automated systems are being evaluated, but none can obtain the 3-D information needed to screen thick areas in which cells are piled on top of each other. In manual screening, a technician adjusts the focus repeatedly and mentally combines information from multiple depths.

Rensselaer researchers, working with James N. Turner of the New York State Department of Health, have found a way for automated systems to do the work of the technicians. Badrinath Roysam, assistant professor of electrical, computer, and systems engineering, and Timothy J. Holmes, associate professor of biomedical engineering, have teamed up for the project. After proving the feasibility of the concept, Roysam obtained a $180,000 grant from the
Whitaker Foundation to build a working prototype.

Their microscope uses a piezo electric material, which changes size when an electric charge is applied, thereby moving the slide 50 to 70 microns. The microscope collects 30 optical sections in the second this takes, and the parallel processor builds a 3-D picture and analyzes all nuclei for size, shape, and texture to detect abnormalities.

In addition to Pap smears, the researchers expect the system to be useful for screening bronchial washes, gastrointestinal samples, fine-needle aspirates, and other smears of body fluids.

Reducing Risk of Oil Spills

To avoid another accident like the one involving the Exxon Valdez and to help ships navigate harbors safely, it is necessary to identify and monitor "bad actors" on the water—the ships and navigators who routinely pose a navigational risk. Reducing risks of oil spills actually may have more to do with regulating fuel transfer facilities and smaller vessels—fishing boats, ferries, and recreational boaters—than with regulating larger ships, says Martha Grabowski, research assistant professor of decision sciences and engineering systems.

These are the results of a study funded by the Washington State Office of Marine Safety, commissioned to assess the risk of oil spills in Puget Sound. The State Office of Marine Safety (OMS), which has legislative authority to regulate marine transportation on state of Washington waters, perceived that oil spills were increasing. But the agency was experiencing difficulty quantifying that risk.

"Many regulators believe that increasing regulation for large oil tankers and shippers is the way to reduce the risk of oil spills. Everyone was looking at Exxon and the other big shippers. However, the greatest number of oil spills occur at fuel oil transfer facilities and come from tugs, barges, and smaller tankers, rather than from the big ships. It's only the big ships and shippers that we hear about and remember," says Grabowski.

In order to develop a risk assessment tool for OMS, Grabowski, two professors from George Washington University, and several graduate students rode vessels on Puget Sound, and discussed the waterway and risk with ship's pilots, masters, and mates on watch. Using the risk profiles developed by these experts, the team then examined accident and near-miss data from the past 20 years on Puget Sound. Both the experts and the data agreed: reducing risk of oil spills had more to do with perennial "bad actors" and smaller vessels than with increased monitoring of larger oil tankers. The team then developed a risk assessment tool for OMS that allows them to concentrate their resources and attention on the more risky, rather than less risky, operators.

The next step is to develop a similar tool for the Columbia River between Washington and Oregon, since navigating that narrow river is different from transiting the more open waters of Puget Sound. In addition, tools for other states are under development.
Folsom Library may have to put up a few new shelves because there's been a spate of books written or edited by Rensselaer faculty this year.

The School of Architecture has been especially prolific, with a total of six publications hitting the stands this year. Mark Rea, associate professor of architecture and director of Rensselaer's Lighting Research Center (LRC), served as editor-in-chief for the Lighting Handbook, published in August. Judith Block, also of the LRC, was managing editor for the handbook, which received a special award for excellence in editing and production at the annual conference of the Illuminating Engineering Society of North America. Block also served as editor of a major review publication, Selected Papers on Architectural Lighting.

Meanwhile, another book from the LRC will try to fill a gap in information on lighting for homes, according to Kathryn Conway, head of the center's technology-transfer program.

The book, The Lighting Pattern Book for Homes, was written by Conway and Russell Leslie '80, associate director of the LRC, to aid general contractors, utility companies, and those who sell lighting supplies.

David Haviland, professor of architecture, is completing editorial work on the 12th edition of The Architectural Handbook of Professional Practice, to be published by the American Institute of Architects next summer. The handbook is the profession's premier source of guidance for establishing and operating architectural and design firms. Haviland has been working with 60 contributors on a major revision of the four-volume handbook.

Donald Watson, professor and dean of architecture, completed a revised version of his 1983 book, co-authored with the late Kenneth Labs, Building Climatic Design. The revised version of this book is accompanied by a ROM disk version of the text, which enables application of climatic analysis to buildings in over 250 locations in the United States. Watson also published Energy Design Handbook, which compiles principles and practices of energy-efficient and environmentally sound building designs.

Finally, the Center for Entrepreneurship of New Technological Ventures (CENTV) has received a grant to publish a handbook on developing, managing, and directing business incubator centers. Mark Rice '71, director of the CENTV and assistant dean of management, is contributing to and co-editing the book (see "Last Word," page 48).

Povall and Branda Miller, associate professor of arts, are the faculty members most closely involved with the project, although Povall says just about everyone in the department is participating. Students do all the production, direction, camera work, and publicity involved with the broadcasts.

Artists who participated in the series, called "In a Word, With Technology," this fall included video and installation artists Tony Oursler, Constance De Jong, and Stephen Vitiello, and musician Robert Ashley, last year's artist-in-residence at iEAR. Slated to appear this spring are artist and writer Guillermo Gomez-Peña (in February) and performer Pauline Oliveros with writer Ione (March 30).

The artists and the national audience will be able to interact in each program, Povall says, through two-way live telephone conversation as well as Picture Tel (two-way interactive video carried over the telephone lines). "What that means," Povall says, "is people can call in and interact with the artist. Someone with an instrument in Vancouver can play a piece with Robert Ashley here in Troy. "Sure, we have a lot of technical nightmares to solve," Povall says, "but it's going to be very exciting."

For information on how you can see the broadcasts, contact iEAR Studios at (518) 276-4778.

Learning by Satellite

A group of computer science students at Rensselaer made history this fall when they attended a course originating from an institution located in another city in another state. The course, User Interface Development, is taught by Michael Danchak, dean of engineering and science at the Hartford Graduate Center (HGC) and an expert in human/computer interaction.
The course is brought to Rensselaer using two-way interactive compressed video (ICV) technology. ICV works by digitizing and then compressing standard audio and video signals and transmitting them over phone lines, much the way a telephone call is transmitted.

“...technology finally allows the students and instructor to interact over distance,” Danchak says.

ICV has come to campus as a collaborative project between the Rensselaer Satellite Video Program (RSVP) and Information Technology Services.

“This technology breaks down geographic barriers to education and creates a virtual classroom that spans the globe,” says Susan Bray, director of RSVP. “The course represents an addition to Rensselaer’s computer science offerings and provides campus students the opportunity to interact with corporate students. It is for this reason that the Computer Science Department at Rensselaer, RSVP, and the Hartford Graduate Center have agreed to cooperate on this unique educational experiment.”

Danchak teaches the course at HGC. Students at Rensselaer see him live on television monitors in RSVP’s video classroom, and Danchak’s class at HGC can see the Rensselaer students on their own classroom monitors. Additional groups located at an HGC satellite campus in Groton, Conn., Sikorsky Aircraft, and Pratt & Whitney participate in the same manner.

Professor and students at all sites are able to see, hear, and interact with one another as if they were in the same classroom. The course is also taped and transmitted by satellite to students at seven industrial sites that traditionally participate in the satellite video program.

To augment the interactivity of the course, students can communicate with Danchak via electronic mail and through special “video office hours.” Joaquim Jorge, a doctoral student at Rensselaer who also has expertise in human/computer interaction, serves as local course facilitator and provides additional support to Rensselaer’s on-campus students.
A Comfortable Collaboration

Four new chairs have been created in Rensselaer’s School of Architecture. Not faculty chairs though. These are director’s chairs, creative versions of the popular folding seat often found on movie sets.

The unique pieces were created by eight students in a wood design course as part of a project that linked Rensselaer with a 90-year-old furniture company in northern New York.

Sid Fleisher, adjunct assistant professor of architecture, challenged students to start with the strengths of the popular canvas and wood director’s chair and, using their imagination and architectural know-how, create variations that would be both innovative and designed for manufacture.

The eight students involved in the project created a two-person love seat, a reversible chair, a reclining chair, and a sleek, ultra-modern folding chair.

The lumber, cloth, hardware, project critiques, and insights on manufacturing were supplied by Telescope Casual Furniture in Granville, N.Y., where Robert Vanderminden Sr. ’51 is president and CEO and where his son, William Vanderminden ’86, is product manager.

The project allowed the students to work with industry and take an idea from the drawing board and crude models right on through to the crafting of full-scale prototypes. “They worked in teams. That’s important, because architecture is full of teamwork. Architects have to learn to work with other people,” says Fleisher.

The idea began with Albany architect Keith Cramer ’88, who’s designing a museum for Granville. The museum will feature the industrial history of the Slate Valley region and Cramer hoped that the museum’s furniture could be locally produced and imaginatively designed. When Cramer discovered that people at Granville’s Telescope Furniture were also Rensselaer alumni, the possibilities were obvious for a rewarding partnership. Cramer got his former wood-design teacher together with the Vandermindens and the unique educational venture was launched.

Helping Rensselaer students also helped Telescope Furniture, says Bill Vanderminden. “One of the things I’ve learned in this business is that almost everything’s been tried before. This gave us a chance to consider some very original ideas at very little cost.”

PUTTING YOU IN THE MOOD—TO WORK

Robert Baron, chair of the department of managerial policy and organization at Rensselaer, received a U.S. patent in March for a unique device designed to enhance personal space. Baron hopes his device, called the Invomatic 120, will make your office a nicer place to work.

“This environment-enhancing system is based on the result of the scientific literature concerning effects of the physical environment on task performance and productivity,” says Baron, who shares the patent with partner Frederick Haber. “We believe this is the only product in the personal-environment market that has a solid basis in research findings.”

Baron’s invention is aimed at improving three environmental factors: noise, air quality, and fragrance. The patent covers a design that contains a state-of-the-art air filtration system that removes up to 99.75 percent of dust, pollen, and smoke in the air; a copyrighted SoundGuard system that removes distracting noise through the use of modified “white noise,” a mixture of many different sound frequencies; and a fragrance cartridge that releases scents found to counter the adverse effects of stress as well as increase performance by increasing alertness.

“This product helps people modify their personal working environments so that they are more comfortable, which in turn contributes to their productivity,” says Baron.
Exciting new opportunities for undergraduate and graduate study at Rensselaer got another boost with the creation of the department of philosophy, psychology, and cognitive science.

Formed from a merger of the departments of philosophy and psychology, the new department is one of the few places in the country to feature research in cognitive science, according to John M. Koller, its chair. "Simply put, cognitive science is the investigation of what knowledge is, how it's produced, and how it can be represented and used," Koller says.

Philosophy's groundwork in the theory of cognition, psychology's reputation for rigorous experimental and applied studies, and Rensselaer's interdisciplinary strengths in such fields as computer science, decision sciences, and electrical engineering, will help undergird a distinguished program, Koller says.

The doctoral and research programs are expected to be in place by fall 1996. Leadership in the design of that program is being provided by David Boles, associate professor of psychology, and Selmer Bringsjord, associate professor of philosophy, co-chairs of the cognitive science task force. Michael Zenzen '66, professor of philosophy and Michael Kalsher, associate professor of psychology, are committee members.

The new department could play a central role in refining a unified theory of interactive learning and could develop sound research methods for evaluating Rensselaer's success in this initiative, Koller says.

Koller also believes that opportunities for study and research in cognitive science will appeal to the many high school students fascinated by science, computers, and the human mind. "We expect to attract 15 to 20 new students a year," he estimates.

Cognitive Science at Rensselaer

Meet the Class of 1997

The approximately 950 freshmen who entered Rensselaer for the first time this fall represent a wide variety of talents and interests. There are 46 valedictorians and 45 salutatorians; 230 participants in student government, including 100 class officers; 350 musicians/vocalists who participated in bands, orchestras, jazz ensembles, and choral groups; 290 editors/writers/journalists for school newspapers, literary magazines, and yearbooks; 49 actors/actresses who had leading dramatic roles; 767 athletic participants from teams around the world; 87 fast-food workers; and 66 grocery store baggers.

The class of 1997 comes from 37 states and 32 countries. It includes:

- a student who learned to walk again after a car accident.
- the winner of the U.S. presidential award for rain-forest preservation.
- a student who performed a comedy routine entirely in Latin.
- a student who organized the escape of his family from Vietnam.
- two brothers who are part of a triplet.
- a hiker who spent the summer on a solo hiking trip from Maine to Alaska.
- a student who built an airplane from scratch.
- the president and founder of "Totally Comics."
- a poet-rapper.
- a student who created a database of tombstones in his local cemetery.
- the number 1 cyclist in New Jersey.
- the number 1 cyclist in New Jersey.
Every fall for the last 21 years, Rensselaer students have participated in an unusual ritual revolving around season tickets to Engineers' hockey games. As students return to campus for the start of the fall semester, they head to the Rensselaer Union to purchase books, supplies, and to sleep outside for more than a month to purchase hockey tickets. The tradition started in 1973 when the old Houston Field House had several supports holding up the roof of the building. To get the choicest seats (those with an unobstructed view), students began queuing up for tickets. Individuals as well as groups such as fraternities and sororities stake out a spot on line, then settle in for the long wait. Although people are allowed to "spell" one another for classes and rest periods, the spot must be maintained for the duration of the line.

Since the renovation of the building more than 10 years ago the supports are gone, but the line remains a constant. In 1985, after the Engineers captured the National Championship, the hockey line began forming in April and continued more than six months. Rensselaer students received national attention from Sports Illustrated and the CBS morning program with Charles Kuralt. The hardy students who brave the line are rewarded for their wait. The president, head hockey coach, and athletic director all take part in the tradition by serving the students coffee, hot chocolate, and doughnuts on the morning tickets finally go on sale.

Last spring the Rensselaer baseball team advanced to the NCAA Division III post-season tournament for the third time in four years. The Engineers finished the season with a 26-11-1 record, one of the top 16 teams in the country. One of the main reasons for the success of the team over the past four years was the arm of Doug Drumm. The right-handed starting pitcher won almost every conceivable award as a senior, including selection as a first-team All-American.

Doug Drumm became the San Francisco Giants' 18th-round pick of the Major League Baseball amateur draft and was signed to a minor-league contract to play for the Everett, Wash., Giants of the Northwest League. "I was a little nervous at first," admitted Drumm. "It was a lot different playing in front of over 3,000 fans. I also expected the players to be like gods, or something. When I got there, I'd say that I was just as good as them."

Drumm had an impressive beginning to his pro career. He started his first game and struck out five batters in the first five innings and did not allow a run. Next for Drumm will be a trip to either Scottsdale or Phoenix, Ariz., for the Giants' spring training in March. If everything goes as planned, the next step would be an assignment with the Giants' Class A farm team in Clinton, Iowa.

"It was a great experience," said Drumm of his first season in pro ball. "I met a lot of interesting people, including Luis Tiant, who used to pitch for the Boston Red Sox."

Drumm is currently finishing up the last 10 credits toward a degree in civil engineering from Rensselaer; he's scheduled to graduate in December.

**Scores**

- As of press time, the Rensselaer football team was off to a 5-2 start with wins over Coast Guard, WPI, Siena, Mariot, and Rochester.
- Men's soccer had an 8-4 record with wins over Vassar, Utica College, RIT, St. Rose, Castleton State, Albany, Ithaca, and North Adams.
- The women's soccer team finished the season with a 3-8-2 record, wins over Alfred, Vassar, and Clarkson.
- The field hockey squad finished with an 8-4 record, advancing to the NYSWCAA State Tournament. The eight wins were the most in school history.
Clearing Up Filtration Problems

Pressure-driven membrane filtration processes help desalinate sea water, concentrate proteins and other biological products, and recycle paints in auto plants. Membranes are used to make low-alcohol beer and soft cheeses, they help purify waste water, and about 140 membrane filters in the Boeing 747 clean hydraulic fluids.

These processes are all plagued by the buildup of dissolved and suspended substances on the membrane. Rensselaer researchers have patented a design that reduces these fouling problems for a variety of separation processes, thereby cutting costs and reducing energy consumption.

The design, described by Georges Belfort, professor of chemical engineering, at the 1993 International Congress on Membranes and Membrane Processes in Heidelberg, Germany, creates hundreds of vortices in the flowing fluids, and these tiny whirlpools scrub foulants from the membrane surface. Dow Chemical Co., which funded the research, holds the right to license the U.S. patent for the device from Rensselaer.

A number of solutions had previously been tried, including running the fluids through rough channels very fast to induce mixing, repeatedly reversing the flow so the resulting turbulence would remove the foulants, or placing inserts in the channel to cause mixing. Most of these approaches presented design difficulties or were heavy energy users.

Belfort and his team took a new approach. Instead of beginning with a module design, they began with the fluid mechanics and then designed a module that would best take advantage of these fundamental laws. The design that resulted runs the liquid through a narrow, curved, slit channel between flat, porous walls, with the curvature and the gap width mathematically calculated to create and maintain the vortices.

This approach illustrates the importance of fundamental science to engineers who tackle applied problems, Belfort says. He worked closely with mathematician Mary Brewster, formerly with Rensselaer and now with the University of Colorado at Boulder, to develop a complete understanding of the fluid mechanics. Belfort also collaborated with William A. Edelstein of the GE Corporate Research & Development Center in Schenectady to use nuclear magnetic resonance flow imaging to obtain a non-invasive view of the vortices being created within the module. These techniques are now being used to improve the design and operation conditions.

Tests conducted on a baker's yeast broth and on dairy whey showed that the spiral design increased performance by more than 20 percent over filtration by a standard crossflow module.

ENDURING LIFE'S UPS AND DOWNS

During the last full week of the 1993 hockey line outside the Rensselaer Union, members of the Lambda Chi Alpha fraternity set up a seesaw to raise funds for the Children's Hospital at Albany Medical Center. With teeter-totter help from the sisters of Phi Alpha Sigma sorority, and pledges and donations from friends and passers-by at the Union, more than $4,900 was raised, far in excess of the $2,000 goal. The brothers, who make a tradition of being first on the hockey line, say they'd like to make the fund-raiser an annual event. Pictured below are seniors Thomas Lee (l) and Alicia Martino.
Architecture grad Steve Fabrikant '75 has designed himself a niche in the clothing world.

By Marcy A. Stryker

On the elevator ride to the 24th floor, you're immediately struck by the names on the wall. This building, at 550 Seventh Ave. in New York City, is home to some of the biggest names in designer clothing: Geoffrey Beene, Donna Karan, Ralph Lauren, Oscar de la Renta. At the top of the building, in an office that faces the famous city street commonly known as Fashion Avenue, Steve Fabrikant '75 designs his clothing. An unassuming guy, Fabrikant shows up for an interview in blue jeans, a T-shirt, canvas basketball sneakers, and a baseball cap, brim folded up. This is not what you'd expect from a designer whose fans include Jane Pauley and Oprah Winfrey and whose clothes are sold in America's most exclusive stores—Saks Fifth Avenue, Bergdorf Goodman, and Neiman Marcus. One of Fabrikant's designs recently graced the cover of *Women's Wear Daily*, the bible of the fashion industry.

As you enter the Fabrikant offices, the first thing you see is a large, framed sketch of a dress design called "Transformations." The design starts with a simple circle on top of a rectangle. Through several stages, the architectural lines and geometric shapes disappear and the design becomes a long dress.

It is a vivid portrayal of Fabrikant's ability to connect architectural training with fashion design. Ask to see something from Fabrikant's current collection and you'll see another indication of his architect's training. The clothes are stored in a structure of gray stone complete with a roof made of green glass "eaves." Fabrikant believes that like buildings, clothing offers protection, and similarly, he protects his clothing with an architecturally driven structure.

So how did this building-minded graduate end up designing dresses? When Fabrikant graduated from Rensselaer's architecture program in 1975, he found architecture was different than he had imagined. He soon realized that designing buildings was not for him, and he returned to New York to join his parents' women's wear company, H. Fabrikant. Instead of working for a few months as he had planned, he stayed seven years, and then left to launch his own line. Fabrikant started his company in 1984, specializing in knitwear, which has become his trademark. His favorite fabric is a combination of wool and rayon made exclusively for Fabrikant. The company has continued to focus on knit dresses and suits, and in 1988 introduced its first woven collection. His
FASHION
look for this season is softer, more romantic than past designs. One dress, for example, features handcrafted cameo buttons surrounded by delicate lace.

**DRIVEN TO SUCCEED**

Fabrikant peppers his conversations with car analogies, evoking his passion for automobiles. (He drives a Range Rover and a 1959 two-seat, cream-colored Mercedes convertible with a red interior.) “You have to give your customers what they expect or they won’t be happy with you,” Fabrikant says. “It’s like Ford. People buy a Taurus because they want a good family car. You don’t buy a Taurus because you want the newest thing.”

Fabrikant’s designs express a similar functional and practical approach. “Customers of the ’90s know more of what they want. Not that they didn’t have self-confidence before. But as the boomers get older, there’s more emphasis on staying at home. My designs are not strict. They travel easily from home to work to evening wear,” he states.

“The gala parties of the ’80s are no more. In the ’90s, there’s a more relaxed manner of entertaining. Extravagance is out,” says Fabrikant. “The knits I design are great because they are relaxed, they’re easy. They also pack well.”

If functionality is a major part of his designs, so is creativity. And, again, Fabrikant calls on his architectural training for inspiration.
“No one gets ideas in a vacuum. Writers read a lot of books. I look at lots of architecture, design, and clothing magazines. I get ideas from buildings.”

A lot of Fabrikant’s ideas come in the same manner they did at Rensselaer.

“I crunch it, just like in architecture. In school, the quietest place was the design studio. Here at the office, it’s tough to be creative. There are too many distractions. The design team and I get out of the office for a week. We sit in our apartments, and go and put things together,” he says.

DETAILS, DETAILS
In his designs, details are key. “It’s the wheels that make the car,” Fabrikant says. He spends hours at a time meeting with the jewelry designers who create the intricate buttons and trims that make a Fabrikant piece so special.

In fact, Fabrikant and his designers begin the design process with the details. First, they spend time picking out buttons, trim, and colors. Then, they work up the clothing that will be the foundation for his designs. And it’s all done within a certain time, and on a tight schedule. Steve Fabrikant Inc. employs 20 people full time. The company puts out four lines a year—spring, fall, holiday, and resort—and each season requires 75 to 100 pieces. In addition to himself, Fabrikant keeps a staff of three designers busy. All three are under 30, and Fabrikant says their youth adds a freshness to his lines.

Fabrikant has lived in New York City since he was 14, when his parents returned from Rio de Janeiro, Brazil. Fabrikant’s wife, Nancy, president of the company, is in charge of marketing and sales. The couple has a 1-year old daughter, Paris Alexis, and a woolly, curly-haired dog named Caesar (who, the designers say, has served on occasion as inspiration for designs).

Fabrikant enjoys the immediacy of his work. “You design something, and in a few months, it’s a dress. It’s not like architecture, where you design something, and there are delays, and there are changes. It takes a long time.

“If I had pursued a career in architecture, everything would have been long range,” he continues. “In fashion, everything is now. It’s spontaneous, and I love it. I have immediate gratification.”

Fabrikant is a businessman with focus and direction. He hopes to introduce a bridge line, (“which is not a line of bridges, but a line of less expensive clothing”), and some menswear. Maybe even a few dresses for Paris.

Also, this self-admitted manufacturing dinosaur is looking to add new machinery to streamline the production process. “I’d be adding creativity because of what machines can do now. But I also owe it to Paris, as a member of the next generation, to do things more high-tech,” he says.

The man who might have built buildings will continue to draw on his architectural training as he pushes the frontiers of fashion.

“There are lots of parallels between architecture and clothing design. I’m just designing a different kind of protection. And like in architecture, you grow and evolve. Designing every season is only fun if it’s an extension, and not more of the same.”

RENSSLEAER 17
The Undergraduate Research Program, in its seventh year, teams students and faculty for hands-on research.

BY ELLEN KATZMAN

Rensselaer senior Bridget Dillon silently witnesses a killer at work. Alone in the laboratory, she watches cancer cells invade normally healthy tissue. The telltale evidence: peaks and valleys on a computer screen.

Dillon is working with Nobel laureate Ivar Giaever '64 and Senior Research Scientist Charles Keese '71 on a ground-breaking device that measures cell growth through fluctuations in electrical impedance. Part of Rensselaer's unique Undergraduate Research Program (URP), Dillon was one of the 625 students who teamed with faculty members last year for hands-on research.
Opportunities for undergraduates to work with a Nobel Prize-winner are almost unheard of, and at many universities serious research is only for graduate students.

“We are one of only a very few schools in the country that do undergraduate research on this scale,” says Herbert Richtol, dean of the Undergraduate College and developer of the program. “While many schools have limited programs restricted to a very few students, we encourage every full-time undergraduate to apply. The only condition is satisfactory academic standing.”

The program, which is in its seventh year of operation, offers hands-
on research opportunities with one-on-one mentoring from faculty for either credit or pay. Students can choose from among the topics offered on InfoTrax, the school's computerized information system, or invent one of their own.

"I've found that all students benefit from the experience," Richtol continues. "Even previously unmotivated students have been turned around by the program."

**New Dimensions**

The students aren't the only ones who gain from URP, says Charles Keese, for whom working with undergraduates is one of the real advantages of teaching at Rensselaer. "These fresh young minds add a whole new slant to the research."

Over the years, Keese and Giaever have trained URP students to be valuable members of their lab team. "Our undergraduates are an extra pair of hands," says Keese. "But that's not all. They're top-notch students, and they're driven. If you take the time to break them in, you have very enthusiastic researchers."

Dillon has been working with Keese and Giaever in their lab since her sophomore year. For the past year she's been spying on cancer cells as they metastasize in an electronic petri dish, known as the Electrical Cell-Substrate Impedance Sensor (ECIS). Small electrodes in each of five wells of the culture dish monitor changes in impedance that mirror changes in cell behaviors. The changes are then instantaneously graphed on a computer monitor.

"The theory is," says Dillon, "that cancer cells, unlike normal cells, can't sense each other and therefore crowd on top of one another. When placed on top of healthy epithelial cell layers, they cause the epithelial cells to separate and grow underneath them."

Dillon is comparing the computer findings with known data on cancer growth to validate the ECIS procedure. Despite her casual dress, T-shirt and jeans, Dillon is all business in the lab: preparing normal cultures, inoculating them with cancer cells, patiently collecting data, and actively discussing findings at weekly meetings with Giaever, Keese, two graduate students, and another undergraduate, Natasha Manlongat '94, who has just joined the project.

It's not all romance. Students learn the ups and downs of lab work. During the summer, notes Dillon, "we had to stop work for two weeks to combat a round of infection. We had to clean out the incubators and sterilize everything."

**Just Do It!**

Over at the Voorhees Computing Center another URP student, Joel Lord, demonstrates the software he's created. "You just click on a couple of elements in the periodic table on the right side of the screen."

The menu vanishes and spheres dot the screen—blue for oxygen, red for bromine, gray for carbon. The mouse clicks on "rotate" and the images spring to life, with the white bonds moving out from behind the atoms. The clearly defined geometric shapes of a fairly complex molecule, bromoprogesterone, jump out of the screen.

Lord is a fourth-year chemistry major who's been dabbling with graphics programming since first grade. During his organic chemistry class last fall, he sensed the frustration of some of his classmates who were struggling to visualize 3-D molecular structures from a flat, hand-drawn model on an overhead projector.

A sophisticated computer work station and a projection screen in the lecture hall caught his eye. Computers, he thought to himself, are particularly good at depicting three dimensions.

After class Lord poured out his idea for a computer model to his organic chemistry professor, Leah Frye. She looked him in the eye, grabbed him, and said, "DO IT!"

By the time he walked from her office to meet Assistant Professor of Chemistry Curt Breneman, his eventual adviser on the project, she had e-mailed an urgent message to Breneman, "There's someone coming—TAKE NOTICE!"

Over the past nine months, Lord has imported chemical structures and refined graphics. The result is a program so simple that "the instructor can build a molecule on the fly in less time than it takes to draw something on the
overhead,” says Lord. And once a molecule has been built on the computer, it can be saved and recalled for future reference.

This fall the program was in place for organic chemistry students; eventually, Breneman hopes to make it available to students across campus. “The long-term goal,” says Lord, “is not only to have a program that’s easy enough for anyone to use, but one that is robust enough for researchers to find useful.”

**On Site, Off Campus**

Not all URP work is on campus. With sawdust-covered clothes and the din of hammers and saws in his ears, fourth-year architectural student William “Burr” Rutledge’s surroundings are a far cry from the sterile environment of the biophysics lab or the silence of the computer center.

He is working at the Rensselaer Technology Park in a prototype house for Architecture Professor Walter Kroner’s Home Erector System. One of Rutledge’s projects has been helping Kroner finish construction of a movable 12-foot wall partition. The module accommodates a number of interchangeable parts—a shelf unit or a closet or even an acoustical blanket.

“Everything in the house is easily removable or expandable to suit the needs of the family,” explains Rutledge. “It can be built by three or fewer people with no special skill at a price 20 to 30 percent less than other comparable structures.”

On-site, hands-on experience is invaluable to an architect, says Rutledge. “It’s amazingly different from studying in a classroom or even working through a problem in a studio. You’re part of the design process. Each ‘Wouldn’t this be easier’ from a team member leads you closer to the design solution.”

**Capping It Off**

At another off-campus research site, a landfill in Massachusetts, Tim Myers and four other undergraduates are working with Tom Zimmie, a professor in the department of civil and environmental engineering. They are collecting paper sludge in order to test the feasibility of replacing the traditional clay landfill caps with recycled sludge from a local paper mill. In addition to finding a new use for the sludge, the project promises to save $50,000 per acre over traditional capping methods.

“We’re testing the permeability of the paper sludge,” says Zimmie. “Ideally the cap works like a plastic bag, keeping out rain or snow,” preventing contamination of the ground water.

Back in the laboratory, Myers freezes and thaws the sludge and measures the effects on permeability. Myers, a farmer’s son who feels at home with dirt between his fingers, is a civil engineering major with an environmental minor. “I used to go out and look at soil and sense when it was no good,” he says. “Now I can go into the lab and understand why.”

**Six and Still Growing**

Since it began in 1987, the URP has grown almost sixfold. Part of the reason for its success, according to Richtol, is the eager participation of the faculty.

“Over 250 professors volunteered to take part,” he points out. “They get bright young students with a tremendous amount of exuberance participating in their research areas.”

And as far as the students are concerned, “they’re not sweeping floors or washing bottles. They’re participating in meaningful research with a knowl-
Paul Severino graduated from Rensselaer in 1969 with a bachelor's degree in electrical engineering. At just 30 years old, he became a cofounder of his first company. Five years later, he started his second company; four years later still, he sold it for $65 million.

Currently enjoying the phenomenal success of his third company, Wellfleet Communications, Severino recently has been featured in *Fortune* and *Inc.* magazines and the following article from *The New York Times*.

Closer to home, Severino was named Rensselaer's 1993 Entrepreneur of the Year by the Center for Entrepreneurship of New Technological Ventures and was honored at a ceremony on campus Oct. 15.

According to Mark Rice, executive director of the center, an entrepreneur is someone who aggressively pursues opportunity with great persistence, energy, drive, and commitment, and is willing to take a chance.

The Entrepreneur of the Year award recognizes the excitement that a company represents, Rice says. It's partly the success of the company, he says, but it's also "an exciting concept, exciting idea" that is being honored. Severino, he says, knew what he wanted—and needed—to do to build Wellfleet Communications into the technology star it is today.

Having been through the startup and growth periods of three hugely successful companies, Severino has gained the right to offer advice to budding entrepreneurs. His is simple: "You have to have enough interest, enough belief, in what you're doing to see you through the mistakes," he says. "And you will make a lot of mistakes. You can't let yourself get discouraged."

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By Glenn Rifkin

High on the bluffs overlooking Cape Cod Bay, Paul J. Severino shifts uncomfortably on the deck of his summer home here.

Usually, this secluded spot offers a haven, but today a photographer snaps away while a reporter hovers nearby. Severino hates having his picture taken, just as he disdains the flash of a wealthy lifestyle. But if his company continues its astonishing run of success, he'll have to get used to the attention.

This unassuming 46-year-old is cofounder, chief executive, and president of Wellfleet Communications, a high-technology star recently named America's fastest-growing company by *Fortune*.
Success
Wellfleet takes its name from the Cape Cod community where radio pioneer Guglielmo Marconi's towers once transmitted telegraphic signals around the world. "It's an interesting analogy to what we're doing," Severino says.

...magazine for the second straight year. Its average annual growth rate over three years is a stunning 250 percent.

Revenues more than doubled in its latest fiscal year, ended June 30, to $180 million. Profits for the 7-year-old company rose 140 percent, to $28 million. And analysts say Wellfleet's meteoric rise is not likely to level off any time soon as the market niche in which the company competes—tying together local area computer networks with equipment called routers—is red hot and virtually untapped.

Some say Wellfleet, based in Billerica, Mass., north of Boston, was lucky in catching a cresting wave at just the right moment. But those who have watched closely credit Severino as the architect of an expertly fashioned assault on a new market.

Severino is a rarity in high technology, a strong leader and a highly respected hardware engineer who also has a keen intuitive sense of the products he is building, knowing what to market and when.

Severino is unafraid to get his hands dirty in the machine shop and cannot be misled by overenthusiastic techies. He is quick to challenge his engineering staff, his mild manner becoming unyielding, if he believes they are wrong.

And nearly two years ago, he stood alone against the collective wisdom of his board and refused to accept the idea that Wellfleet's next generation networking product should merely add features to the existing product. He insisted on a whole new product, called the Backbone Node. It made its debut in July 1992 and has been a big success. In the most recent quarter, Wellfleet shipped 400 units, already accounting for 10 percent of its sales.

"He was right," said one director. "The revenue numbers speak for themselves."

MANAGEMENT & TECHNOLOGY

Severino not only understands the technology thoroughly but has kept a firm managerial grip on the tail of this comet. He is a superb manager who maintains strict control over budgets and operations. "Surprises are for birthdays," Severino said.

Mary Henry, a communications analyst at Goldman Sachs, says: "This company has been public for eight quarters and has had eight consecutive quarters of exceeding expectations. I regard it as one of the best-managed companies in telecommunications."

Severino can talk for hours with any bench engineer in his company, but he is equally at home discoursing on management philosophy and venture capital.

"It's interesting when you have a CEO who can speak the language of the lowest guy doing the coding in the corner as well as the investment banker and the customer," said Frank Dzubeck, a telecommunications consultant and president of Communications Network Architects, a consulting firm in Washington. "He's a unique duck."

Henry predicts that Wellfleet will grow an additional 80 percent in 1994, to $325 million in sales, with profits jumping 65 percent. Wellfleet went public in July 1991 at $17 a share, and its stock, already split two for one, closed at $48.25 on Sept. 3 this year. Dozens of early employees have become paper millionaires through stock options.

Wellfleet does not even come close to leading the market. It runs a distant second to its bitter rival, Cisco Systems Inc. of Menlo Park, Calif. Cisco, itself No. 5 on the Fortune list of fast-growing companies, dominates the router busi-
ness with $650 million in sales and up to 60 percent of the market.

But because of its fast growth, Wellfleet garners most of the media attention.

Even cynics, who say Severino's most significant accomplishment was simply being in the right place at the right time, agree that he is a technology visionary. The proof: Wellfleet is Severino's third successful start-up venture, a remarkable achievement in an industry littered with one-hit wonders.

"Venture capitalists seek out a guy who made it once and back him again. But it's amazing how many second-time misses there are," said Dzubeck.

All of which puts a great deal of focus on Severino, who grew up in a blue-collar area of New Jersey and rode a love for engineering from Don Bosco Technical High School in Paterson to the heights of entrepreneurial success.

After stints as an engineer at Digital Equipment and Prime Computer in the late 1960s and early '70s, Severino, spurred by start-up fever he'd encountered at both companies, decided he needed the excitement of his own new venture.

In 1976, he left Prime and became a co-founder of Data Translation, a Framingham, Mass., maker of computer components that transform analog signals into digital ones. There, he helped engineer triple-digit growth by the time he left.

Then, in 1981, with support from Russell Planitzer, a venture capitalist at J. H. Whitney & Company, Severino jumped into the networking and communications arena by starting Interlan Inc. The minicomputer networking company took off, growing to $20 million in revenues by 1985, when Severino sold out to Micom Systems for $65 million. But Severino wasn't satisfied.

He saw unlimited potential in the emerging networking market, which in the mid-'80s was just coalescing. Scores of personal computers infiltrated corporate America but could not communicate with one another. Local area networks, which tied these PCs together, were quickly gaining in popularity, and Severino correctly identified a vast market for a product that would allow these networks, whether from the same or different manufacturers, to be hooked together.

**COURSE CORRECTION**
Severino thought Wellfleet would capture the market by being the first one in. But Cisco shocked him by plunging into the market with similar technology. Taken aback, Severino decided to compete where Cisco was not: in the
Predictions say that Wellfleet will grow an additional 80 percent, to $325 million in sales, in 1994, with profits jumping 65 percent.

very high end of the router market, aiming at large corporations with complex needs. "He felt that was where the market would gravitate to next, and he was right," said Dzubeck.

Not surprisingly, Severino's biggest fans are the venture capitalists.

"To say Paul is a great entrepreneur for his investors would be an understatement," said Planitzer, now chairman and chief executive of Computervision, a technology company in Bedford, Mass. Planitzer and Severino worked together at Prime before Planitzer left to pursue a venture capitalist career. He now sits on the Wellfleet board.

"Paul called and said we should start a communications company together," Planitzer recalled. "I said, 'You run it and I'll finance it.'" Interlan was the first company he started, with a $650,000 investment realizing $20 million. J. H. Whitney also poured $3 million into Wellfleet in 1986, an investment worth $300 million today.

In fact, Severino said he was ready to become a venture capitalist himself with a New York firm in 1986 but the group wanted him to move to New York City, far from his beloved Cape Cod.

"I decided it was better to take all this technical expertise I'd gathered and try this one more time," Severino said. With his track record, he had little trouble gathering $20 million in financing and attracting a stellar team of engineers and managers.

Severino, not surprisingly, has high praise for the uniquely American institution of venture financing and says he plans to try his hand in venture capital when he leaves Wellfleet, which may not be far off.

He had already reaped millions with his two earlier ventures, and his stake in Wellfleet is worth more than $65 million. Sitting on the deck of his cedar-shingled summer home in Truro, Severino admits that it gets harder and harder to rise each Monday morning at dawn and make the two-and-a-half-hour drive to his office, leaving behind his wife, Kathy, their daughter, Cassandra, and the lure of the cape's golf courses.

"It's the only place Paul relaxes," Kathy Severino said as he barbecued hot dogs.

Until he steps down, Severino refuses to slack off as a role model for his employees. Usually the first one in and last one out of the office, he is motivated by the game, producing a winner for his investors. "I decided early if you were to work hard and have a career, you should do it for high stakes," he said.

The pressures do get to him. Severino was renowned earlier in his career for his volatile temper and outbursts in meetings in which he unflinchingly humiliated underlings when things were not to his liking. "He had a way of making you feel very small if he was mad at you," said Craig Benson, a former employee at Interlan and now chairman of Cabletron, of Rochester, N.H.

Benson said start-ups need someone like Severino, a stern taskmaster who won't settle for second-best. But he
RENSSL EAER GRADUATES have always been well-represented in the ranks of entrepreneurs. Perhaps it's a product of Rensselaer's rigorous technical training or its emphasis on creative problem-solving. Or maybe, as in the case of Paul Severino, it's a combination of the two.

Whatever the reason, countless graduates have taken the plunge and started their own businesses. Though their enterprises vary greatly, they share a common spirit and drive. Here, three of Rensselaer's entrepreneurs share some of their experiences:

Frank Fischer '64 is president, CEO, and director of Ventritex Inc. The Sunnyvale, Calif., company designs, manufactures, and sells implantable defibrillators and related products for the treatment of ventricular tachycardia and ventricular fibrillation, the most serious and life-threatening forms of abnormal heart rhythm.

Fischer, who was brought on board just two years after Ventritex's founding in 1985, says his mission was simple: "to develop a world-class company that produces the best products for treatment of ventricular tachyarrhythmia that exist." In eight years, the company has grown to a market value of almost three-quarters of a billion dollars, according to Fischer.

He considers research vital to anyone testing the waters of entrepreneurship. "Learn as much as possible about your market and what you're trying to accomplish," Fischer advises. "Understand your product. It has to make sense for you. Don't base your judgment on what other people tell you."

For Ventritex and Fischer, the bottom line isn't the only rule they live by. "We intend to make a difference," Fischer states. "Real satisfaction comes from having the opportunity to talk to patients and realize the impact that you have on their lives."

Architecture graduate Kirk Rose '84 wants to impact the world as well, albeit in an artistic sense. Rose founded his company, dESIGN, in 1992 "to bring the higher ideals of design to the mass market; to make fine design available to people who otherwise couldn't afford it," he says. His firm encompasses architecture, furniture lines, and paintings.

dESIGN is modeled after the philosophies of Walt Disney and Andy Warhol, two artists who achieved fame because their works "struck a common chord" in everyone, Rose says. "I want to create something that is beautiful not only to art connoisseurs, but to regular people," he says.

Founding a company takes more than just vision, Rose says. "It takes an ability to face the challenge of the unknown," he states. "That's a personal trait you either nurture or sweep under the rug. Not everyone can take that challenge."

Andrew Dressel '84 has two very diverse views of entrepreneurship. One of the founders of the highly successful Mapping Information Systems (MapInfo), which in 1992 was named Inc. magazine's 23rd fastest growing company, Dressel is currently on sabbatical to help start a business incubator in Kiev, Ukraine (see story, page 6).

"Entrepreneurs are faced with a lot more hurdles in Kiev," Dressel states. "Right from the beginning, there is a social stigma attached. They're much more jealous of individual success."

Dressel's experiences with MapInfo, which grew an astounding 6,000 percent from 1987 to 1991, have shown him what he believes to be the secret to entrepreneurial success: teamwork. "Right from the start, we were a cohesive team," he says. "We all wanted the same thing—to be a phenomenal success!"

Helping entrepreneurs get started in a country where entrepreneurship is a brand-new concept has also helped Dressel. "It's been good practice for my patience," he says with a chuckle. "It takes unbelievably longer to get things done in Kiev."

His advice to anyone thinking about starting a business? "Definitely do it!" he exclaims. "If you wait, you might not ever do it. And it's absolutely worth trying."

—TRACEY LEIBACH

Since it began shipping products at the end of 1988, Wellfleet has installed more than 13,000 routers, mainly in Fortune 500 companies, universities, and other large institutions.

added that Severino's volatility drove several of the most talented engineers out of Interlan.

Usually soft-spoken, Severino admits that he "was a bull in a china shop" earlier in his career. But he claims to have settled down. He is utterly unglamorous and shuns the accouterments of newfound wealth. The summer home, purchased before he started Wellfleet, has been his one indulgence. The Severinos, afraid to appear ostentatious, only reluctantly reveal plans to build a 10,000-square-foot dream home outside Boston.

Henry remembers walking into a July 1991 meeting at which Goldman underwriters were ironing out details of Wellfleet's initial public offering. The conversation turned to the windfall Severino was about to reap. On the day of the offering, Severino's stock was valued at $14 million.

"Someone asked, 'What kind of red car do you think Paul Severino just bought?'" Henry recalled. "Everyone was guessing Ferrari, Maserati, Porsche. It turned out the right answer was an Oldsmobile Cutlass."

Severino became the butt of jokes at Wellfleet recently when he threw off his conservative cloak long enough to purchase a red convertible Nissan 300ZX.

Severino figures he has started his last company. He points out that start-up requires at least five years of heavy nurturing, a commitment he longer wants to make. "How many good ideas," he asks, "can you have in one lifetime?"
FALL ALUMNI WEEKEND '93

Mother Nature couldn't have provided a better backdrop for Fall Alumni Weekend, Oct. 15-17. A capacity crowd gathered on '86 Field to cheer on the football team. The Engineers made a valiant effort to keep the Dutchman's Shoes Trophy, but in the end, conceded defeat to Union, 19-16. Prior to the game more than 170 alumni and guests enjoyed lunch at the Quad Party, many with the students they mentor. Others treated their families to Rensselaer's award-winning Technology Fair, while still others kept the tradition of tailgating alive. The Rensselaer Alumni Association held meetings, fraternities and sororities hosted alumni members, and the Patroons met for a dazzling event recognizing their contributions to Rensselaer's New Century Campaign and its impact on campus. Through it all, no one complained about the weather.

Rensselaer's Technology Fair involves alumni and their families in a variety of demonstrations, including this student-designed and built race car.
MENTORS MEET THEIR MATCHES; MORE NEEDED

The Student Chapter of the Rensselaer Alumni Association thought they had a good idea when they devised the Student Alumni Mentoring (SAM) Program. When 420 freshmen signed up the first year, they knew they had a great idea.

What they didn't have—and still don't—were enough alumni mentors to go around.

So now instead of recruiting freshmen to be advised, SAM is looking for alumni mentors to advise them.

Many alumni, who otherwise contact students by phone or e-mail, took advantage of Fall Alumni Weekend to travel to campus and spend time with the freshmen they mentor. More than 25 alumni mentors met with their students over lunch at the Quad Party.

By the end of the weekend, 330 of the 420 freshmen who originally signed up had been matched with mentors; most with alumni, some with seniors.

Brian Smith '94, president of the student chapter, is one senior who greatly enjoys being a mentor. Smith says the freshman he advises, Brian Dean '97, contacts him regularly. "He wants to make sure he's going in the right direction," says Smith. "It's like Big Brothers, Big Sisters."

Dean values his relationship with Smith. "It's given me a chance to lean on somebody when I need help." But Dean says he can appreciate the extra dimension an alumnus would bring to a mentor relationship. "Having an alumni mentor would allow a student to see the workplace and develop contacts outside the school," says Dean.

And, he adds, "Alumni realize what students need because they've already been through it."

If you'd like to be a mentor, contact Anne Ferraro '90, assistant director of alumni relations, (518) 276-6058. Matches are made by hometown and major, when possible.
Class Notes

Class Notes Deleted for Privacy Concerns
Incubating Entrepreneurs

Starting a business can be a daunting challenge. Often the product or service is far from ready for the marketplace; the market is uncertain and how to get to it is a mystery; the business is undercapitalized and cash flow is negative; and the entrepreneurial team is incomplete. It is easy to see why so many new businesses fail or barely survive in the "land of the living dead."

Fortunately, more and more new companies are able to turn to business incubators for crucial support in the early stages of start-up.

Business incubators stimulate the creation and development of new businesses by providing flexible lease space, shared business services, management and technical assistance, and access to resources through a community network.

Rensselaer's Incubator Program was one of 10 early pioneers when it opened in 1980. Today there are more than 500 in the United States, with a new incubator opening on average once per week.

There are three fundamental principles of business incubation:

- Maximize the focus of resources on developing companies.
- Minimize the expenditure of resources for administrative overhead.
- Maximize the expenditure of resources aimed at developing and implementing a sophisticated portfolio of assistance mechanisms for new ventures.

Using those three principles as a foundation, I have outlined eight "best practices" in business incubation to guide the successful incubator company:

**Start Smart.** Do your homework before you start and do it right. Create a business plan for the development and management of the business incubator that defines the path from start-up to self-sustainability.

**Structure the incubator organization to minimize governance.** Too often incubators and their sponsors became obsessed with the activities associated with governance, the politics of financing and the general business of running the incubator. They lose sight of their fundamental mission—to help companies start-up, survive, and succeed.

**Get the right incubator director.** The incubator director needs to be an entrepreneur. Too often the incubator director is a capable real estate manager or an administrator of government programs, but not an expert in new business development.

**Get the right building.** This is another critical condition, since leasing space is the single largest source of cash flow for most incubators. Getting the right building can make or break the incubator as a business in its own right.

**Gain leverage through the judicious involvement of stakeholders.** Accountants, lawyers, bankers, small-business consultants, and experts from a local university can provide valuable assistance to incubator companies.

Get the right mix of tenants.

**Up-and-Comers.** Ready both in terms of responsiveness and capacity to take off with the help of persistent assistance by the incubator director.

**Superstars.** Having made it through start-up and survival and now well on their way to success, they are role models for the up-and-comers and they provide great PR for the incubator in its marketing efforts.

**Anchor Tenants.** Stable rent payers that require little or no attention from the incubator staff.

**Long Shots.** Not yet far enough along to warrant intensive assistance from the director, but the incubator environment can be a catalyst in their maturing process.

**Target assistance mechanisms to each segment of the tenant mix.** The incubator director must target assistance where it will have the greatest impact using a complete portfolio of assistance techniques—including flexible, affordable space; shared business services; counseling; and training programs.

**Push the up-and-comer companies through the start-up and survival modes toward growth and ultimate success.** Too often companies linger in "la la land," just getting by. The incubator needs to drive the up-and-comer companies and then structure the hand-off to a competent management team and board.
Profile of a Donor

Edgar M. Cortright Jr.
RPI Class of 1947
Aeronautical Engineering

Family:
Wife — Beverly Hotaling Cortright
Two children, two grandchildren

Career:
National Advisory Committee for
Aeronautics' Flight Propulsion
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NASA Unmanned Space Programs;
Director, NASA Langley Research
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Type of Gift:
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Thoughts on the Subject:
"I wanted to make a gift to Rensselaer, so I studied the benefits of trusts. I learned that by funding a trust with appreciated securities, I could avoid capital gains and estate tax. With this gift, I'm helping RPI and my children. Without a trust, the children would only receive 30 cents on the dollar from my estate. But with the scholarship trust, the children will be taken care of. I didn't have to pay capital gains tax on my securities, I get income for life, and many students will benefit from the scholarship money. What could be nicer — or easier?"

A Note on Trusts:
You may use a variety of assets to establish a trust, although most are funded with highly appreciated securities or real estate. Rensselaer invests the assets for growth and income, and the donor (or another named individual) receives a quarterly income for life based on the value of the gift. In addition, the donor receives substantial current and estate tax benefits.

For more information on trusts and other types of planned gifts to Rensselaer, call the Rensselaer Office of Development, Ruth Killoran, at (518) 276-8309.
SPOT THAT FACE IN THE CROWD

The friend you haven't seen since graduation. Or since E-Dorms, or F-Tests, or GM Week. The one who helped you with Calculus, or held your place in the hockey line. That friend will be looking for you, too. Come, catch up and reminisce at Reunion '94, June 9-12 if your class year ends in 4 or 9, or if you're a member of the 50 Year Club.

For more information call or write:
Irene Wynnyczuk, Director of Reunion Programs, Office of Alumni Relations, Heffner Alumni House, 1301 Peoples Avenue, Troy, New York 12180-3500
Phone: (518) 276-6205  Fax: (518) 276-4081