Don’t Touch That Dial
Alumni behind the scenes in the television industry
Win cash and the chance to pitch your business plan!

If you are an ALUM, FACULTY, or STAFF member with hopes of starting or expanding your own business, you could win a CASH PRIZE and present YOUR BUSINESS PLAN to an audience of venture capitalists hosted by Rensselaer alumni.

Announcing the

1997 RENSSELAER BUSINESS PLAN COMPETITION

Sponsored by the Center for Technological Entrepreneurship in the Lally School of Management and Technology.

The business plans will be judged for originality, thorough market analysis, solid financial planning, and a coherent business strategy.

For details on how to enter, contact: Jane McCumber, Manager, Center for Technological Entrepreneurship, The Lally School of Management and Technology, Rensselaer Polytechnic Institute, Troy, NY 12180, (518) 276-8398, or mccumj@rpi.edu.

John Haller '86 of MapInfo, Rensselaer's most successful spinoff company, wrote its business plan 10 years ago in the management course Principles of Entrepreneurship. Your company could be next!

MapInfo now occupies a 40,000-square-foot facility in the Rensselaer Technology Park.
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Rensselaer is! Many alumni are applying their technological training behind the scenes in the world of television.

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August marked a special milestone for Rensselaer. At this year’s Freshman Convocation on Aug. 24, the university welcomed more than 1,050 bright young men and women into the Rensselaer family. It is one of the largest freshman classes in recent years!

The statistics on the class are just as impressive as the number of enrolled students. This year’s freshmen have an average SAT score of 1,267 (up 2 points from last year) and represent 39 states and 26 countries; 55 percent of the students are in the top 10 percent of their high school class, women comprise 25 percent of the Class of 2001, and this year 175 Rensselaer Medalists are among the university’s new students. Our schools of engineering and science are welcoming robust classes this fall, and new programs such as Electronic Media, Arts, and Communication (EMAC) are continuing record-setting student interest and enrollment levels (see page 17 for more on EMAC).

Throughout the disciplines, a new generation of students has embraced the university’s mission with tremendous enthusiasm. Faculty and staff members report that high school students have been eager to learn about Rensselaer’s distinctive brand of interactive, technological education. The university experienced an increase in the number of high school students and their families visiting campus this year, meeting with faculty members, and sitting in on classes. And, more of the students accepted to Rensselaer for fall 1997 enrolled this year, up 4 percentage points from 1996.

The large number of excellent students interested in Rensselaer demonstrates that the university’s mission of technological education and research is more relevant, and more important, than ever before. These students know they will enter a global marketplace that is information-based and driven by advances in technology. They must be prepared to work in multicultural teams across time zones and around the world, utilizing strong leadership and communication skills. A Rensselaer education gives our students a competitive advantage and an entrepreneurial spirit no matter what career path they choose.

Rensselaer’s recent student placement statistics illustrate the demand for our graduates in the workplace. This past year, the university was featured in a USA Today article titled “Dream Jobs Abound for High-Tech Grads.” The writer spoke with a senior in electrical engineering who had interviewed with several interested potential employers before accepting a position with a starting salary of more than $45,000. It is not an uncommon occurrence for our students. In fact, Rensselaer’s Career Development Center reported 98 percent placement three months after graduation, with average starting salaries for B.S. holders at $41,315 and M.S. graduates at $49,470.

Often as I visit alumni around the world, I am asked to describe Rensselaer today. Are the students well-qualified for a rigorous technological education? Is the university providing a world-class learning experience, so that our graduates can make their marks in the next century? In response, I can point with pride to the achievements of our graduates and the successes of our alumni. You would have shared my pride at Freshman Convocation, welcoming these talented students who have chosen Rensselaer because the educational experience is second to none. On that day, members of the Class of 2001 took their first steps on a path of learning and discovery that will serve them well throughout their careers and their lives.

President Pipes met with members of the Class of 2001 at Student Orientation this summer.

Another reason to be proud: at press time I learned that Rensselaer has once again placed in the top 50 national universities in U.S. News & World Report’s “America’s Best Colleges” issue Aug. 25. Read more in the December magazine.
A Passion for Anonymity

Hall of Famers Evoke Memories

Your June issue cleared up a 40-year-old mystery for me. As an undergrad I was looking through the Institute catalog and under endowments there was a listing for a John Marshall Lockhart. At the time I believe catalog and under endowments but no one I asked had a clue as to anything. I couldn’t imagine that.

BARRY M. GLASGAL '60 Strongsville, Ohio

R

Regarding the article on the Rensselaer Alumni Hall of Fame: The contributions of the Roebling family (both John, the father, and son Washington) are duly noted. But lesser known is the fact that John Roebling, grandson, invented the WWII amphibious landing craft, the “LVT,” that carried our nation’s Marines and Army troops into battle and to the shores of enemy-held islands in the Pacific Theater. The LVT was immensely successful and numerous improvements were incorporated as battle experience dictated. I hope that the grandson, John, was a Rensselaer alumnus, being a member of the illustrious Roebling family. NEIL KREBS '55 Stephentown, N.Y.

T

The “Hall of Fame” concept is a novel approach for recognizing alumni that have contributed in the development of technology or other areas of our society. As you can appreciate, “I’ve heard these songs before”; however, the way they have been presented is a new and perhaps more current approach to introducing RPI’s achievers/contributors to the younger readers. I look forward to hearing more about our alumni that will be elected to the Hall of Fame.

A short article in the July ASME News is both related and newsworthy. ASME has named Donald Roebling’s “Alligator” amphibian tractor a Mechanical Engineering Landmark. It did not relate if Donald was an engineering graduate or identify his alma mater. Did he, like his grandfather, graduate from RPI?

AL BIRKS ’53 CORINTH, MISS.

Editor’s Note: According to Institute Archivist John Doak, John A. Roebling, Class of 1888, was the son of Washington Roebling. He assisted his son Donald in the development of the Roebling Alligator, an amphibious tractor used by American armed forces during WWII. He was the principal stockholder in John A. Roebling Sons, manufacturers of wire and cable. The firm was founded by his grandfather, after whom he was named. He died Feb. 2, 1952.

Richard Frost ’40 Remembered

I was sorry to read in the March issue of the death of Richard Frost ’40. His son, David ’71, provided a good overview of some of Dick’s many achievements, but left out one of the best — the time Dick “bombed” Stapleton Field in Denver!

This took place in either 1959 or 1960. By this time, Dick was executive vice president of Stanley Aviation, and the company was deeply involved in developing the escape capsule for the B-58 bomber. Chief engineer on the project was Max Bleck ’50, and I was in charge of negotiating the project contract.

In any event, it was necessary to perform airborne drop tests of the capsule to check on its aerodynamics stability. This was done by dropping the capsule out of the belly of a surplus T-28 aircraft that the company had acquired. The capsule was loaded into the plane at our plant on Stapleton airport, and dropped over the nearby bombing range at the Navy’s Buckley Field.

On one such test, the technicians loaded the capsule, and Dick was to do the testing. Just after becoming airborne, while still over the Stapleton runway, the capsule somehow came loose, and fell harmlessly between the runways!

If I recall correctly, one of the local radio station’s commuter traffic reporting planes happened to see our old T-28 drop a “bomb” on Stapleton!

No harm, no foul, but it took a lot of explaining at the time!

Dick went on to start his own company; Max Bleck advanced to bigger and better things at Raytheon, and I moved to California.

RONALD F. VOIGT ’52 IRVINE, CALIF.

Hartford Grad Center History

In the March ’97 issue, page 15, “A Brief History” is a bit too brief and overlooks the origin of the proposal for the Hartford Graduate Center.

In the 1940s, Pratt & Whitney’s East Hartford complex included a Wind Tunnel facility, which was home to the United Aircraft Research. At the time, P&W was an RPI/MIT stronghold of Aero. Eng. graduates and UAC Research was no exception. In the early ’50s, Joc Grandfield (MIT), head of the Flight/Engine Performance Section, was of the opinion that a graduate engineering program in the area was essential.

After convincing John Lee, head of UAC Research, of the need, he approached MIT; but they were not interested. The requirement

Mail alum.mag@rpi.edu
still existed and Rensselaer was equally as qualified as MIT, thus the opportunity was presented to Rensselaer and as they say, the rest is history.

Bob Barnes '44
Wayland, Mass.

Eliminating Scholarships based on gender

I would suggest that RPI seriously consider eliminating scholarships based on gender. I am referring specifically (but not exclusively) to the Herman Family Fellowships for Women in Entrepreneurship and to the MBA Fellowships for Female Entrepreneurs as advertised in your June 1997 issue. The evidence presented in the ad implying that women face special "hurdles" is largely contrived and anachronistic. The real hurdles in the business world confront all entrepreneurs, and the RPI School of Management does no one a service by artificially lowering them for one group of people. More generally, sexist and paternalistic "scholarships" of this kind ultimately demean everyone involved, including the recipients. George A. Geri '72, Ph.D. '79 Gilbert, Ariz.

Dave Bohan responds:

We agree that most of the challenges facing today's entrepreneurs, whether starting a new company or helping an established one bring new technologies to market, are the same for both genders. We do believe, however, that it is in Rensselaer's best interests to attract the most qualified women MBA students to our program. Rensselaer as an institution is dedicated to diversity on all levels—student, faculty, and staff. Women represent nearly half of the work force and own eight million businesses in the United States (one-third of all businesses) yet represent only 23 percent of the students currently in our MBA program. Fellowship programs, like the Herman Family Fellowships for Women in Entrepreneurship, will help Rensselaer recruit the finest women MBA students and ensure that the makeup of our student population more accurately reflects the work environment we are preparing them for.

David Bohan '82
Director, Master's Programs
Lally School of Management and Technology

How Do We Look?

You've probably already noticed the changes.

This issue marks the debut of a new look for Rensselaer magazine. We've added a designer to our staff, enabling us to bring the magazine "in-house" and to make some graphic and editorial improvements to the publication.

With the help of reader comments, critique by some of our constituencies, and staff discussion, we've tried to "freshen up" the overall look without vastly changing the content. Here's what we set out to do:

- Update the design to reflect current design standards
- Add content that is appealing to alumni
- Add flexibility to design/content
- Add color
- Organize information in a more "user-friendly" way
- Create an even greater integration with on-line version

We have also added some new features, many of which are located in the At Rensselaer department (formerly Kaleidoscope), which covers on-campus news, milestones, and research.

From the Archives is a peek into Rensselaer's past, featuring some of the people, places, and programs that have helped shape the Institute over the last 175 years.

Hawk Talk Although a quarterly publication cannot "cover" sports in the traditional manner, our readers often tell us they want to read more about sports. We'll introduce you to some of the interesting people on Rensselaer's playing fields.

Data Base will provide interesting statistics about things happening on campus today.

Making a Difference and Staying Connected have been revamped, to make the information even easier for alumni to access. With Staying Connected, we'll give you information on things like upcoming events, services alumni can take advantage of, or ways alumni can get involved with Rensselaer. Making a Difference will recognize outstanding volunteers, announce significant gifts to the Institute, or report on successful regional club events.

Alumni Datebook will help you keep Rensselaer a part of your life, with a rundown of important events and deadlines.

Alumni Services Directory, found on the last page of the magazine, will give you important contact information, a listing of regional chapters, and services alumni can use.

As always, we encourage and welcome reader feedback. We'd love to hear what you think of our new look!
Better Sporting Through Design

AN YOU IMAGINE PLAYING GOLF AND GETTING 18 HOLES IN ONE?

More than 200 students divided into 39 teams in Introduction to Engineering Design were asked to use technology to improve a recreational sport or activity. One team built a “Smart Green” that offers 18 holes of golf in one by mechanically altering the surface.

The prototype projects they devised and built were presented in May to instructors, campus members, and visiting middle school students.

Other projects included a speedometer that monitors a skier’s speed during training for downhill competition, a laser-tag racer for a human-powered vehicle that replaces the more dangerous game of bumper cars, training devices for swimmers, and more.

Goals of this class include teaching engineering students the seven-step design process and enhancing their ability to work in interdisciplinary teams, according to William Foley, senior lecturer in decision sciences and engineering systems, who oversees the course.

Students are judged on the basis of their innovative use of technology, their use of “high technology,” how well their design meets the expectations of the sports market, the extent of integration across the engineering disciplines, and the student-designed and built content of the projects.

According to one local newscaster who covered the event, “Intro to Engineering Design is an introduction to invention.”

(Above) The MogulMate, designed to simulate mogul skiing; (far left) the Smart Green; (center and below) rollerblading for amputees
Milestones

E. Bruce Watson, Institute Professor of Science, has received one of the highest honors that can be accorded a United States scientist—membership in the National Academy of Sciences. Watson, whose scientific investigations of chemical processes in the deep Earth have advanced our understanding of how this planet evolved, was honored in April along with 59 other American scientists and engineers “for distinguished and continuing achievements in original research.” Watson was named by the National Science Foundation as a Presidential Young Investigator in 1984.

Paul Severino ’69 was elected to the Rensselaer Board of Trustees at its March meeting. Severino is a director of Bay Networks Inc., a company he helped found in 1994 when he merged his Massachusetts-based Wellfleet Communications with the Santa Clara company SynOptics Communications. He is a member of the Lally School of Management and Technology Advisory Board. Since 1996, he has been a member of the Rensselaer Alumni Association Technical Entrepreneurship Committee. He was named 1993 Entrepreneur of the Year by the Center for Technological Innovation Technical Entrepreneurship Committee. He was named 1993 Entrepreneur of the Year by the Center for Technological Innovation.

(continued on page 7)

Ecological Economics

Ph.D. Program Is First in the Nation

Rensselaer has become the first school in the country to offer a Ph.D. in ecological economics, according to the International Society for Ecological Economics. The graduate program in economics was recently granted a name change to “Ecological Economics” by the New York State Department of Education.

An article in Science cited ecological economics as one of the fastest growing areas in economics.

Pressing environmental and social problems are interrelated and require new, interdisciplinary approaches for understanding and analyzing them, says Sabine O’Hara, assistant professor of ecological economics and director of the program. Ecological economics examines links among economic, social, technological, and ecological systems. Because decisions based solely on economic indicators neglect essential information, ecological economics favors methods that allow evaluation of complex, multilevel systems.

“This is a cross-disciplinary field with the very practical objective of developing economic strategies that reduce pressures on the physical environment,” says Faye Duchin, dean of the School of Humanities and Social Sciences and herself an ecological economist. “We provide students with concepts and tools to take on some of the major challenges of our times.”

Rensselaer’s pioneering program already has 12 active Ph.D. candidates and a faculty-student ratio of one to four. Students take courses such as natural resource economics, environmental economics, history of economic thought, and ecological economics. Graduates can look forward to careers as policy and financial analysts, university professors, or positions in labor, economic development and environmental conservation, or in the public sector.

From the Archives

40 Years on the FM Dial

On Nov. 1, 1957, WRPI made history when it joined a small but growing group of radio stations presenting regular FM broadcasting. An enterprising group of students had convinced WROW-AM, an Albany-based radio station, to donate an unused FM transmitter to the Institute, allowing WRPI to operate at 1,000 watts with an FM broadcasting radius of 30 miles.

The station at the time was located in the 15th Street Lounge (now the RPI Playhouse). According to then-station manager Ralph Asher ’58 (who recalled the early days as part of a series of interviews taped for WRPI’s 30th anniversary), the majority of the technical work to get the station’s FM broadcast up and running was done by students.

“We had to learn the electrical codes, we ran the conduits under the 15th Street Lounge, snaked power cables between the studio and the transmitter...” Generations of civil engineers had surveyed the campus, making it easy for the students to report the location of the antenna site to the FCC to the 10th of a second.

While that transmitter put WRPI on the FM map, it was in 1968-69 that the current 780-foot transmitter tower in North Greenbush was acquired from then sister-stations WROW and Channel 10 Television, who had switched frequencies. Getting this transmitter tower allowed the station to jump from 1,000- to 10,000-watt stereo, quite an accomplishment for a college radio station.

The station’s next big change came in 1975, when it moved its studios to the basement of the Darrin Communications Center, where it still is today.

For more on WRPI today, turn to page 14. To read from the detailed monologues that relate the history of the radio station, visit WRPI’s Web site at http://www.wrpi.org.
New Way of Looking at the World

A scientific breakthrough that could eventually become as important as X-ray and radar technologies has been invented at and licensed for commercial development by Molecular Opto-Electronics Corporation (MOEC), located in Rensselaer's business incubator.

Called real-time electro-optical terahertz sensing, the new technology was invented under the leadership of Xi-Cheng Zhang, associate professor of physics.

This new imaging capability may soon make it possible to see diseased tissue, electric fields, the chemical composition of plants, and other things undetected by other imaging systems.

Rensselaer and MOEC will collaborate in creating and commercializing imaging systems that use terahertz radiation, according to Charles Rancourt '70, director of the Office of Technology Commercialization.

With a frequency of more than a trillion cycles per second, terahertz signals occupy an extremely large portion of the electromagnetic spectrum between the infrared and microwave bands.

In theory, many biological and organic compounds have distinct signatures within the terahertz region, meaning that their chemical compositions might be examined by the Rensselaer system. Such a capability could be applied to the diagnosis of disease, detection of pollutants, and the quality control of food products.

Until now, no technology existed that could use this radiation to rapidly create images, says Zhang. Imaging work performed by Bell Labs can create images in the terahertz range, but not in real time. The Rensselaer detector can create an instantaneous image of 250,000 pixels.

The unique detector features a zinc telluride crystal onto which the terahertz radiation is focused. At the same time, a laser "readout" beam is directed into the system and used to convert the spatial and temporal (spectral) distributions into visible images that can be captured by a video camera linked to a computer.

The Care and Feeding of Crazy Ideas

To foster innovation, managers should give shrewd, incremental encouragement to gifted workers who have crazy ideas for radical new products, says professor Pier Abetti of the Lally School of Management and Technology.

"Give them a little company time, perhaps some equipment, a small amount of money, and a date when a detailed progress report is due," says Abetti, who has more than 30 years' experience as a leading GE engineer and manager and has studied effective business practice around the world.

"If the employee is motivated and the idea has promise, the resources will be used wisely," says Abetti. "If not, drop it. If so, then keep the research going with another modest allotment of time and money."

At Toshiba, for instance, Ken-Ichi Mori worked nights and weekends at his own expense to prove he had a workable idea for (continued on page 9)
Milestones
(continued from page 7)

Michael Shur, the Patricia W. and Sheldon Roberts '48 Professor of Solid State Electronics, is a co-recipient of the Fiztekh Prize from the A.F. Ioffe Institute. Shur and five collaborators at the Ioffe Institute were honored for a series of papers on plasma wave electronics. In this approach to faster electronic devices, messages are carried by plasma waves instead of electrons.

Pulickel Ajayan, assistant professor of materials science and engineering, received the 1997 Eli Franklin Burton Award of the Microscopy Society of America. Ajayan was honored for his work characterizing structure and defects of composite nanotubes.

Robert Graves, professor of decision sciences and engineering systems and director of Rensselaer's Electronics Agile Manufacturing Research Institute, has received the Dr. David F. Baker Distinguished Research Award of the Institute of Industrial Engineers. Graves was recognized for his lifetime accomplishments in design for assembly, concurrent engineering, and virtual manufacturing.

William Stitt '63, former president and operating officer of ICF Kaiser International, has been named director of the Center for Technological Entrepreneurship (continued on page 10)

Students Reach Out
RenXchange, the new student calling program for the Rensselaer Annual Fund, had an incredible inaugural year. They raised over $200,000 for the Fund. More than 40 students made over 10,000 calls! The program will be expanded this year, so be expecting their call.

Business Plan Competition Ends in a Tie!
Craig Skevington '75 of Flow Management Technologies Inc. and Robert Godgart '82 of Power Adz Corporation tied for first place in Rensselaer's second annual Business Plan Competition. They will receive a trip to California's San Francisco Bay to present their plans to a venture capital audience. The event was sponsored by the Rensselaer Alumni Association, the Alumni Chapter of Northern California, and the Center for Technological Entrepreneurship. (See inside front cover for details on this year's competition.)

P&G Grant to Develop New MBA Courses
The Procter & Gamble Fund has awarded the Lally School of Management and Technology more than $147,000 to develop courses for a new concentration in entrepreneurship for MBA students. The funds will be used to develop three new courses: Corporate Venturing, Negotiating and Selling, and Conducting Business in Emerging Markets. The proposal was one of only four accepted by P&G out of 45 applicants.

Creative Estate Planning, Johnson-Style
Sam Johnson '37 has used a three-pronged approach in his estate planning. During the last capital campaign, Johnson established, by bequest, the Elisabeth C. and Samuel A. Johnson '37 Professorship in Engineering. He also established life income gifts that will eventually benefit the chair. In the interim, he has funded the chair with cash.

During his 60th reunion in June, Johnson gave substantial funds to the chair, which is held by Mark Shephard.

GM Makes Commitment to Five Rensselaer Programs
The General Motors Foundation has given Rensselaer $80,000 to bolster Rensselaer's efforts in five specific areas: Curriculum Innovation, Minority Engineering Bridge Program, the Scholarship Program for Women in Engineering, the Archer Center for Student Leadership Development, and the Career Development Center.

With a Little Help From Our Friends
Well-connected alumni can use their contacts to advance Rensselaer's fund-raising efforts. Ken DeGhetto '50, who is also national reunion vice chair of the Rensselaer Annual Fund, offered to make the case for Rensselaer's School of Engineering before a high official with the Starr Foundation, one of the nation's wealthiest private foundations. The result: $75,000 in new grant commitments.

Reunion Donors Show Class Spirit
Through the energetic efforts of volunteers, reunion classes' support for Rensselaer continues to grow. At Reunion '97, the Class of '37 was honored with the Reunion President's Award for greatest Class Gift and the Participation Award for a 44% participation rate. Not to be outdone, the Class of '47 took home the Ernie Nippes '38 Award for the greatest increase in class participation, with a 7% jump in reunion year. All told, classes gave more than $3 million to their Reunion Class Gift Campaigns, including nearly $1 million to the Rensselaer Annual Fund.
A Japanese computer wizard, Mori and his colleagues produced the first Japanese language word processor. "It was the size of a desk, weighed as much as a refrigerator, and would have to sell for 6.3 million yen ($63,000); but the approach was sound," Abetti says.

With help from Tetsuya Mizoguchi, a Toshiba computer wizard, Mori eventually shrunk the word processor to the size of a laptop and reduced the cost to 160,000 yen ($1,500). "This machine has revolutionized Japanese business practice," says Abetti.

"What Toshiba knew, I learned from them and teach today," Abetti continues. "It's important to encourage creative people, but give them tough tests. Test the thinking. Test the idea. See if your people are serious enough to spend their own time on it."

The laptop version

**Alumni Datebook**

**Oct. 17-18**

**Fall Alumni Weekend**
Football, tailgate party, dinners, and more.
Contact Peter Pedone at (518) 276-6061 or pedonp@rpi.edu.

Oct. 28 and TBA.
**What's on TV?**
Watch a taping of *Politically Incorrect With Bill Maher* on Oct. 28.
Contact John Peruzzi '84, president of the Rensselaer Alumni Chapter of Los Angeles, at his office (310) 838-9766 or by e-mail at john@peruzzi.la.ca.us. Or take an insider's tour of the NBC Studios in New York sometime in October. Contact Heliena Fox at Rensselaer at (518) 276-2794 or at foxh@rpi.edu. (See page 12.)

**Jan. 31**

**Big Red Freakout Ice House (RPI vs. Union)**
Paint the town (or at least your face!) red for this exciting event. Pre-game dinner and fun; post-game refreshments. Contact Peter Pedone at (518) 276-6061 or pedonp@rpi.edu.

**Feb. 13-14**

**Alumni Hockey Weekend**
Former players take to the ice in this annual spirited match. To find out more, contact Peter Pedone at (518) 276-6061 or pedonp@rpi.edu.

**Staying Connected**

**Lots on Tap for Fall Alumni Weekend**
Make plans to come back for this year's Fall Alumni Weekend, Oct. 17-18. Along with the traditional football game and picnic, there will be events for each returning special interest group including: a health-care professionals reunion, Phi Kappa Tau's 75th anniversary at Rensselaer, a Model Railroad Society reunion, a minority alumni reunion, and RSVP's 10th anniversary. It's a great time to see old friends and learn new things. For more information contact Peter Pedone at (518) 276-6061 or pedonp@rpi.edu.

All aboard: Model Railroad Society reunion will be part of Fall Alumni Weekend.

**Patent Professionals Unite!**
Actually, reunite. A patent professionals and lawyers reunion is being planned for fall 1998 and if you're interested in helping with the planning or want to be included on the mailing list, contact Peter Pedone at (518) 276-6061 or pedonp@rpi.edu.

**You Make the Call**
Dates have been set for volunteer phonathons around the country to benefit the Rensselaer Annual Fund: Delaware Valley 9/22, New York City 9/23, Boston 10/7, Baltimore 10/20, and Washington, D.C. 10/21. Phonathons are a great way to get in touch with old friends and classmates as well as raise money for the Rensselaer Annual Fund. If you can help out for a couple of hours, contact Terri Van Patten at (518) 276-8568 or at vanpat@rpi.edu.

**See the World With Rensselaer**
The Rensselaer Alumni Association's travel program is an excellent opportunity to visit exciting places around the globe with fellow Rensselaer alumni. Destinations planned for next year include the Hidden Islands of the Grenadines (Feb 7-15), Amsterdam and Budapest (May 3-19), the Canary Islands (June 10-20), and the Alumni College of Ireland (June 24-July 2). If you'd like more information, contact John Buckley '49 at (518) 274-6562.
Milestones (continued from page 8)

at the Lally School of Management and Technology. In 1996 Stitt was named Entrepreneur in Residence at the Lally School. Last year, Stitt received the Outstanding Faculty Award from Epsilon Delta Sigma, the management honorary society.

Steven Cramer, the Howard P. Isermann Professor of Chemical Engineering, has been named a fellow of the American Institute for Medical and Biological Engineering for his "many distinguished contributions to the field as well as demonstrated interest, concern, and involvement with critical issues affecting medical and biological engineering."

Brian Benicewicz has been named director of the New York State Center for Polymer Synthesis at Rensselaer. Benicewicz was deputy group leader of the polymers and coatings group of Los Alamos National Laboratory. In 1996, he was awarded their "Excellence in Industrial Partnerships Award." He is a member of the American Chemical Society, the author of numerous published papers, and has 10 U.S. patents.

Lester Rubenfeld, professor of mathematical sciences, has been named director of the new Center for Initiatives in Pre-College Education (CIPCE). The center was created to facilitate and increase Rensselaer's extensive work with elementary and secondary schools.

(continued on page 11)

Growing Out of the Petri Dish

IN JUST FIVE YEARS, THE undergraduate biochemistry/biophysics program at Rensselaer has grown to six times its original size, from a brand-new major with only 13 students in 1992 to its present total of 78.

Now the third-most popular major in Rensselaer's School of Science, the enrollment is sure to approach 100 with the next freshman class, says Joyce Diwan, professor of biology and head of the program.

The phenomenal growth of biotech industries and opportunities in medicine, pharmaceuticals, health care, agriculture, and the environment account for the growing popularity of this undergraduate major at Rensselaer. But the success is largely a product of program excellence, Diwan says.

"Compared to many universities, we are unique in the mix of courses we offer and in our tremendous depth in math, chemistry, physics, and biology," she says. "We also have good coop opportunities with biotech industries and an outstanding program in undergraduate research, something that many schools don't provide."

The team-taught centerpiece courses, Molecular Biochemistry I & II, are not just for biochemistry/biophysics majors, says Diwan. These studio-based courses are highly sought by students majoring in chemical engineering, biomedical engineering, biology, environmental science, and chemistry.

In fact, the biochemistry/biophysics program has grown so rapidly that more faculty are needed to keep up with the demand, says Diwan. Advanced courses can only be offered every other year, and class sizes in such courses have doubled.

Graduates almost always pursue advanced studies in biochemistry, biophysics, medicine, or a related field. Some pursue one of Rensselaer's new professional master's degrees in applied sciences.

Baseball Players Drafted

FOR THE SECOND STRAIGHT YEAR, THE RENSSELAER baseball team led the nation in pitching, with a team ERA of 2.42, marking the first time in Division III history that the same team has earned back-to-back national pitching titles.

It really should come as no shock, then, that Rensselaer pitching continued to be in the news even after the season ended, as the team's top two pitchers, two-time All-Americans Billy Snyder '97 (Martville, N.Y.) and Dave Lohrman '97 (E. Amherst, N.Y.), were both selected in the 1997 Major League Baseball Draft.

Snyder was drafted in the 25th round by the Detroit Tigers and will be playing for the Tigers' farm team in Jamestown, N.Y. Lohrman was selected in the 42nd round by the New York Mets and has been assigned to Pittsfield, Mass. Both teams compete in the New York-Penn League.

Snyder finished second in the nation this past year with 13.2 strikeouts per nine-inning game, after claiming the No. 1 spot last season in ERA (1.03). Lohrman finished in the top 10 in the nation in strikeouts last season and was a top-10 finisher in ERA this season. The pair also own several Rensselaer pitching records, with Snyder's marks including career ERA (2.27) and strikeouts in a season (126, 1997) and Lohrman's records ranging from career games won (25) to career no-hitters (3).

As of Aug. 5, Pittsfield Mets Pitcher Dave Lohrman has made 14 appearances and has a 1.80 ERA. He's pitched 20 innings, has 29 strikeouts, and made four saves.
Plasma Waves: Music to Industry's Ears

WHEN A MUSICIAN BLOWS into a flute and pushes particles of air into a resonance cavity, audience members do not wait for the moving air particles to reach their ears. Instead, a pattern of sound waves quickly carries the music to the listeners.

A similar use of plasma waves to carry information could create a whole new generation of devices, which operate as an "electronic flute" and are much faster than conventional computer chips, according to Michael Shur, the Patricia W. and Sheldon Roberts Professor of Solid State Electronics at Rensselaer. He believes the first use of plasma-wave devices may be as extremely sensitive detectors for hard-to-find substances such as environmental pollutants or minute quantities of explosives.

At present, messages on computer chips are carried by electrons moving in a semiconductor. But if industry is to reach gigascale integration (1 billion transistors crowded onto a single chip that operates at 1 billion cycles per second) in the next 10 years, these electron messengers need to travel much more quickly. Shur says plasma waves could carry the data 10 times faster.

He and Russian colleagues at the Ioffe Institute have demonstrated mathematically that electrons in a transistor channel behave as a fluid and that plasma waves propagated in these fluids are governed by the same equations that govern sound waves. Plasma waves, however, travel thousands times faster than sound, and they occur on very small devices. This means plasma wave frequencies are in the terahertz range — more than 1 trillion cycles per second.

Shur, James Lu, a research associate at Rensselaer, and Professor Robert Weikle at the University of Virginia have successfully built a primitive version of a detector that makes use of these waves, and its operation agrees well with earlier mathematical predictions. This nonresonant device operates at relatively low frequencies to detect microwave radiation. The next step will be to build higher frequency, resonating detectors that are more sensitive.

"This is only the modest beginning of plasma wave electronics," says Shur.

Sixteen Daves and 1 Hal graduated with the Class of 1970. Entering this fall are 20 Daves and no Hals. It remains to be seen what doors will open for them.

Milestones

Stanley Landgraf '46, long-time trustee, former acting president, and loyal friend of Rensselaer, died June 29. Landgraf, 71, was a member of the Rensselaer Board of Trustees from 1977 until his death, and served as acting president of Rensselaer 1987-1988.

During his tenure, he oversaw the planning for the Helffer Alumni House. He earned bachelor's degrees from Rensselaer in metallurgical engineering in 1946 and in management engineering in 1947.

Landgraf's many volunteer efforts on the Institute's behalf were recognized by the Rensselaer Alumni Association's Distinguished Service Award in 1988, the Council for Advancement and Support of Education Volunteer of the Year Award in 1986, and the Albert Fox Demers Medal in 1985.

An avid Rensselaer hockey fan, Landgraf chaired the campaign to create the Ned Harkness Athletic Field and Track.

Prior to his retirement in 1985, Landgraf had served as chief executive officer, president, and chairman of the board of the Mohasco Corporation, with which he was associated for almost 40 years. He joined Mohawk Carpet Mills of Amsterdam in 1947, and after its merger to form Mohasco Industries, he headed its carpet operation as group vice president.

He was president of the nonprofit Capital Region Technology Development Council 1985-1995. He served on the board of directors of several corporations.
"If you’ve watched TV today, you’ve seen RPI."

So says Charles Jablonski ’77—and he should know.

Vice president of broadcast and network engineering for the National Broadcasting Company (that’s NBC to you and me) and executive vice president of the Society of Motion Picture and Television Engineers, Jablonski has been a part of the television industry for 20 years. He’s one of a number of Rensselaer graduates who are responsible for putting television—from sitcoms to soaps, breaking news to Olympic moments, commercials to kids’ stuff—on the air every day.

They are network executives, producers, television system design specialists, and postproduction creators. They have strong connections with one another; many of them cut their broadcasting teeth at the campus radio station, WRPI. And they’ve often crossed paths throughout their careers.

Though you may not recognize their names or faces, you’ve almost certainly seen something they’ve touched. All of them are applying their technical and creative know-how behind the scenes for our viewing pleasure.

**Winning Combination**

That mix of technical skills and creativity is crucial to success in the television industry, according to Jablonski. As vice president of broadcast and network engineering for NBC, he has responsibility for all the technology planning, equipment development, and technical project coordination for the network.

“Base technical skills are important,” he says, “but what makes you succeed is the ability to take a very strong technical background and apply it variably to the situation.”

Jablonski recalls one experience he had while heading up the engineering for NBC’s coverage of the 1992 Olympic Games in Barcelona. European television is fundamentally different than American television and a box was needed to convert the signal.

“I was sitting in a design lab for a French company, with this person who spoke no English, and I spoke no French, and we were arguing in mathematics back and forth to one another! This was differential equations and advanced calculus, which had not crossed my radar screen in 15 years, and it just popped back into my mind. And my staff was sitting there, looking at me, and all we’re doing is standing at a whiteboard, arguing about which is the best way to do this and how it would work.”

His efforts paid off; Jablonski was awarded one of his three Emmy awards for his technical efforts at the Games. (He also received Emmys for the ’88 and ’96 Games.)

Jablonski joined NBC in 1983 as a project manager for systems engineering. In 1988 he was
named chief engineer, responsible for the network's satellite and network distribution systems. Prior to joining NBC he was chief engineer of WNET, the PBS flagship station in New York.

Jablonski's technical background still serves him today, though he spends more time in conference calls and board room meetings than doing hands-on engineering.

"As with most engineers, my biggest challenge is being able to explain technologies to people who aren't technical people, and how it solves problems for them. I spend virtually all my time now doing business plans, analysis, stuff that I had no idea an engineer would do."

Geoffrey Felger '74 understands solving problems. As director of engineering systems services for ABC Television, Felger manages more than 140 people and handles many of ABC's engineering issues, including the design, construction, and maintenance of new studios, control rooms, mobile broadcast units, and videotape and graphics facilities.

"As a member of engineering management for ABC, a major part of my job is to understand the complete scope of the projects that involve my engineering staff. Every job requires me to be aware of many aspects, such as, is the technology right, are we on budget, can this project be accomplished in the time allowed," Felger says. "I have to be able to provide the necessary engineering detail in an executive overview to judge the feasibility and potential for success of each project. If there's a problem, we want to recognize it in the early stages and fix it."

Felger, too, has been in the business for more than 20 years, nearly all of them at ABC. He started there as an engineer, doing audio and communications for the 1976 political conventions. Next, he worked on construction of a new sports mobile broadcasting unit for ABC, "kind of a dream job," Felger says. "We basically had to stuff a technical facility larger than most local TV stations into three tractor trailers." That unit and the two that followed have covered events such as the Kentucky Derby, Indy 500, U.S. Open Golf, the World Series, and a number of Super Bowls.

After heading up the field operations division (including ever-increasing roles in ABC's coverage of the Olympics in '80, '84, and '88, for which he and ABC's engineering team won Emmy awards), Felger was asked to take on the studio side of the New York-based television operations. Productions included Good Morning America, World News Tonight, All My Children, and One Life to Live. "My job was to provide supervision to all of the technical aspects (and the inevitable headaches) of each program," he says.

Though he's glad to be back on the engineering side of ABC today, Felger admits there is a tradeoff. "Working on the engineering is great for the sake of the hardware and the exciting technology we're experiencing in this decade, but operations also has its appeal because it is closer to the show-business element."

"There's not much that can compare with opening up a newspaper and finding that three of the top 10 programs in the national ratings (Monday Night Football, Prime Time Live, and 20/20) went on the air with engineers and facilities provided by your department. There aren't many jobs where so many people get to see the results of your work on a weekly basis."

**Still a Thrill**

**Knowing that millions of people are simultaneously viewing the product of your work is a fact somewhat unique to the television industry. Dean Winkler '80 enjoys that aspect daily.**

"I still get a thrill seeing our work on the air. It's one thing to watch it on the monitors in our control room, but when I'm at home or out somewhere and see it actually out there, I still love it. Watching our commercials on the Super Bowl was amazing!"

Winkler is president of Post Perfect, a New York City-based company offering a complete range of television post-production audio and video services. Their specialty is the design and execution of computer graphics and visual effects, creating TV commercials and pro-

Radio Days

Besides sharing an industry and an alma mater, the alumni interviewed for this feature also share a common experience: WRPI. The radio station was, for each of them, an invaluable introduction to the world of broadcasting and information technology. Though a few did on-air work, most concentrated on routing signals, designing circuit boards, or building the control rooms that help to air one of the region's most eclectic mixes of music, news, and politics.

WRPI has been a hands-on training ground for students interested in broadcast production for 40 years (see, also, page 6). Its mission—to provide a place, facilities, and training for students and community to work together to produce and broadcast diverse noncommercial cultural, entertaining, and educational free-format programming—is much more than music.

According to WRPI President Steve Pierce, a doctoral candidate in the Department of Science and Technology Studies, the station "provides an incredible learning experience for students. We get leadership training in a real-world context. We run a radio station, full-time, with no paid staff. It's a place where students can apply the education we're getting in the classroom."

One of the strengths of WRPI has always been that students work side-by-side with
of WRPI, a terrific assets and postproduction company in California, and Graham was devoting himself fully to his own video production business.

"The industry had changed in the six or eight years that I was out of it; it became more free-lance, less specific to an entity like NBC or CBS." That's worked out well for Pascucci. In addition to covering horse racing for CBS, he's done the Formula One racing circuit for ESPN. For NBC he worked on the Today show, which led him to the Summer Olympics in Korea. ("That's where I ran into Jablonski. I was literally walking down a hallway the first day I arrived, and at the end of the hallway was Charlie.")

At the '96 Olympics in Atlanta, Pascucci was in the NBC control room when the bomb went off. "I was technical manager for the late show," he recalls. "We were probably a half-mile or so away from where it went off. It immediately changed the complexion of our program. We stopped being a sports program and started being a news event."

Pascucci is happy with the path he chose. "I've had the opportunity to go around the world any number of times working on projects for television, and still have this quasi-rural lifestyle in Saratoga Springs. Now, if you measure success by hard currency, than perhaps I should have gone to New York. But if you measure it by quality of life, than I think I've been pretty successful."

West Coast Connections

THOUGH A LOT OF TELEVISION NETWORK OPERATIONS ARE STILL BASED in New York, there's no denying that Hollywood is home to much of the industry. Several Rensselaer grads made the move to the Pacific time zone and haven't looked back.

National TeleConsultants of Glendale, Calif., is one of the largest TV systems design firms in the world. Its founding principals are Elliot Graham '67, M.E. '74, Charles Phelan '67, MBA '76, and Peter Adamiak '72; Rich Hill '73 is a senior consultant with the company.

In 1980, Phelan was general manager of a television production and postproduction company in California, and Graham was director of engineering for a facility there. "We wanted to get back to our roots, designing and building things," Phelan recalls.

Adamiak at the time was still in New York, as manager of engineering for ABC's owned and operated stations. "We felt that a really strong combination would be the three of us, because we're com-
plematory to each other. Peter left a seven-year career at ABC to join his two college buddies and start this fledgling company."

NTC has grown into a 50-person company with a client list that includes the giants of the industry: Fox Broadcasting, Disney, Warner Bros., MTV, ABC, CBS, NBC, Universal, and Nickelodeon, to name a few. They’re now in the final stages of installing systems they designed for Fox’s new 250,000-square-foot network origination center in Los Angeles, due to go on line at the end of the year.

Phelan says that what National TeleConsultants does — work with clients to design and install efficient, cost-effective broadcast facilities — relies heavily on that mix of creative and technological skills learned at Rensselaer.

“It’s a different kind of creativity than somebody doing an anima-

Kevin Hamburger ‘75 feels the same way. “I say I’m noncreative, but I often think that’s not fair to me.” As supervising producer of Politically Incorrect With Bill Maher (which airs weeknights on ABC), Hamburger is involved in various creative aspects of the show, as well as “all the business aspects, the financial aspects, the administration, most of the hiring and firing, dealing with contracts, everything of that sort. Ultimately I’m fiscally responsible for the show.”

It seems like a long way from his days as an electrical engineering major. “I don’t think anybody thought TV and radio was a real career back when I was in school. It was more like a sideline,” he remembers. “I wasn’t as aware of what went on in that industry. My only exposure was WRPI, which was fun, but I didn’t know you could make it a career.”

Make it a career he did. Hamburger’s resume reads like an issue of TV Guide. Like Jablonski and Graham, Hamburger started his television career at WNET in New York. His next move was to ABC, where one of his major projects was the implementation of closed-captioning for the hearing-impaired. (ABC pioneered that effort.)

After five years, Hamburger made the jump to the fledgling MTV Networks. “Some people thought I was crazy — why would you leave a network to go to some cable thing? This was 1981 and cable wasn’t like it is today.” Today, parent company Viacom owns MTV, Showtime, the Movie Channel, VH-1, and Nickelodeon.

“We tried to not fall into the traps that the networks fell into, which is more and more equipment, more and more people. We tried to keep it lean, mean, and cost-effective. When I left the company I think we had 10 networks on the air, 24 hours a day, with a small fraction of network staff.” (Small world: National TeleConsultants designed and built the MTV Networks origination facility on Long Island.)

In 1988 Hamburger made the move to L.A., where he became a partner in Video One, a small company that owns mobile trucks with audio-video equipment. “I went from being an engineer with my foot in the door with operations and production, to being an entrepreneur. It opened up a whole set of situations for me.” Today Video One provides facilities and equipment to producers of sitcoms. Last season, Video One taped Roseanne, Home Improvement, Grace Under Fire, and The Jamie Foxx Show.

“The TV and motion picture industry loves the rental business,” Hamburger explains. “They don’t have to own anything. When the show gets canceled, all the equipment goes away. They rent lights, bleachers for the audience, audio and video equipment.”

As the company grew, Hamburger lessened his day-to-day role and, through Video One, started working as a consultant or producer on other shows.

Projects he’s worked on include several television pilots, the soap opera Santa Barbara, a feature film, and the introduction of prime-time football broadcasts to Fox Sports.

He joined Politically Incorrect last year. Though he does little hands-on engineering work today, Hamburger believes his education was invaluable to his career choice. “Rensselaer was a great training ground for me. I learned that one can learn anything. If you apply yourself, or research, or read, whatever it may be, you can learn about it. That was true when I went to work at MTV and knew nothing about satellite technology; and at WNET I knew nothing about television, only audio. That’s always been true throughout my career.”

“RPI taught me that it’s all out there. You just have to find it and learn about it.”

Alumni Invited Behind the Scenes!

Oct. 28. Sit in the audience and watch a taping of Politically Incorrect. Hosted by Kevin Hamburger ’75. Seats for the 4:45 p.m. taping are very limited. Contact John Peruzzi ’84, president of the Rensselaer Alumni Chapter of Los Angeles, at his office (310) 838-9766 or e-mail at john@peruzzi.la.ca.us.

Sometime This Fall. Charles Jablonski ’77 will host an insider’s tour of the NBC Studios at 30 Rockefeller Plaza in New York. Join the Rensselaer Alumni Chapter of New York City as they take a peek behind the cameras to find out, first-hand, what it takes to be “Live from New York!” For more information, call Heliena Fox at Rensselaer at (518) 276-2794 or e-mail her at foxh@rpi.edu.
Students interested in joining Rensselaer alumni in the entertainment and communications industries face a swiftly changing, multimedia-intensive workplace that demands creative people with strong technical training.

Rensselaer recently received accreditation for its bachelor of science degree in Electronic Media, Arts, and Communication (EMAC), offered by the School of Humanities and Social Sciences. EMAC is aimed at students aspiring to careers in mass media, graphic design, multimedia design, electronic publishing, computer music and arts, virtual reality, software design, information design and management, and document design for corporations and small businesses.

The ongoing technological revolution in communication and information technologies has created a variety of new job possibilities for those who combine artistic interest, communication skills, and talent with strong technical ability.

"The media industry is very hungry for the kinds of people who have both a technical and creative grasp," says Geoffrey Felger '74, director of engineering systems services for ABC Television. "In our graphics area, more and more high-end equipment is being installed and we're demanding much more of the operators there, in picture manipulation, animation elements, programming routines within what's being edited. We're in a constant search for the kind of fighter pilots to run that equipment."

Dean Winkler '80, president of Post Perfect, a post-production company in New York, agrees. "What I really love about television is it's a place where you can combine engineering and art." When he's looking to hire someone, Winkler says he looks for people with a background in both those worlds. "We need people with experience in both sides. If you really want to succeed in television or in entertainment, you need both."

Rensselaer is well-positioned to offer such a degree. The program is jointly run by the Department of Language, Literature, and Communication, which is internationally known for its graduate programs in computer-mediated communication, technical communication, and rhetoric, and the Electronic Arts program, which has won widespread renown in electronic arts and music.

According to Branda Miller, associate professor of electronic arts, "faculty and students alike realize the power of the program—it's an interdisciplinary program with a focus on communication and creativity, uniquely situated in the technological landscape of RPI—that's the key."

Students gain hands-on experience, both inside and outside the classroom, with Rensselaer's state-of-the-art artistic, computational, and creative tools. The EMAC studio, a Macintosh facility located in the Darrin Communications Center, is set up for complete multimedia, sound, video, music, and animation integration, with high-speed access to the Web.

EMAC courses include Information Design and Management; Art, Technology, and Society; Hypermedia; Visual Design; Cyber Arts; Principles of Hypertext; Media Arts Studio; and Communication Leadership and Collaboration.

Christopher Pascucci '00 (whose father, Ralph Pascucci '70, is a video producer) has completed one year in the EMAC program. "I'm a creative person, but I'm also technical. It's tough to find a school that allows you to be both. What attracted me to EMAC was the fact that it's so broad. I have a lot of interests that range from video to audio to music to computers, and EMAC was all of that."

"That's the amazing thing," says Miller. "Our graduates won't be qualified to do one thing or two things or even three things. EMAC graduates will be qualified to do an extraordinary number of jobs. The breadth of their training far surpasses the need of almost any one job position."

"EMAC is a program ahead of its time," Miller says. "Other schools will try to follow the program we've set up."

Empowering the Architect's Imagination

With technology as its tool, the School of Architecture is equipping students with the power to shape the future

By Margaret M. Knight

In July 1995 an internationally recognized architectural scholar and award-winning writer left London to become dean of Rensselaer's School of Architecture.

Alan Balfour had many reasons for choosing Rensselaer—a talented faculty, a progressive curriculum, a location in a complex urban region; but most important was Rensselaer's reputation as a great technological university.

Balfour believes that emerging technologies hold the key to the future of architectural theory and practice.

"We need to harness the new technologies to begin to make clear propositions about the future," Balfour insists. "Nothing would please me more than to see strong imaginations empowered to shape the future, enhancing the quality of life, through a command of technology."

To do that, Balfour has set out to make Rensselaer's School of Architecture an international leader in computer-based design research and teaching.

Designing a Revolution

Room 12 in the basement of the Greene Building is guarded by an electronic combination lock. Brian Lonsway punches in the code and opens the door onto what looks like any ordinary computer lab.

But looks are deceiving. This room is the headquarters of a revolution and Lonsway is directing it. His instruments: advanced Silicon Graphics and NeTpower graphic workstations; the most advanced graphics visualization software from film production and virtual-reality-based manufacturing; 3-D motion-capture hardware; and a professional video editing system that can combine video and computer images. At a conference table wired to the school's high-speed network, students collaborate on projects and plug in laptop computers to project their work on the room's wall-sized screen.

This is the first step in the school's ambitious plan to establish an ultra-sophisticated visualization and reality-simulation laboratory within a design studio.

"This is what I call an 'opportunistic' lab," says Lonsway, assistant professor in architecture. "We're using technologies developed outside the field and investigating how they might change the practice and..."
teaching of architecture."

He points to a student hunched intensely over a screen. "He's working with software designed to create smoke and water effects for Hollywood. We're looking at how these programs might be used to create other dynamic systems, such as streetscapes.

"Virtual reality programs, games, special-effects, and animation software are all tools for visualizing environments. And because that is what architects do, they are ideal for architectural inquiry. To an architect, design is much more than making buildings. It encompasses an understanding of emotion, of lighting, of sound, of body movement in space—in short, it's creating total human environments."

Wired to the Future

ROOM 12 IS JUST THE BEGINNING OF THE revolution. Upstairs, seed funds from one of this year's largest Strategic Initiatives grants* are converting the entire third floor of the Greene Building into the Architecture Design Teaching and Production Studio. Here, in what's called Studio 305, graduate and undergraduate students will explore the design of everything from buildings and landscapes to vast urban infrastructures.

"The design studio has always been at the center of architectural education and practice," says Clinical Associate Professor Mark Mistur '83, who is leading the initiative. "For the last century that studio and its tools have changed very little. But new communication, computational, and visual technologies have created the opportunity to significantly change both practice and teaching.

"If you look at what the most renowned designers have done in the last few years," Mistur says, "you'll see that the shapes and forms are becoming much more complex. All the curves, for instance, are extremely difficult to dimension and to represent by manual techniques. We're now actually building in the computer and we ask it to figure out how to dimension and represent our concepts. That's a fundamental shift."

Designed for flexibility, Studio 305 can support individuals, teams, and large-scale project work for as many as 30 simultaneous users. With network (both local and Internet) connections at each desktop, students will have immediate access to interactive video presentation, professional-quality video recording, and CD-ROM pressing. They will use large-format printing and rapid prototyping equipment, video conferencing connections, and ultra-high-speed links to the school's advanced research lab. It will be an unprecedented set of powerful design and information resources.

According to P. Richard Rittelmann '60, executive vice president of Burt Hill Kosar Rittelmann Associates and a member of the School of Architecture Advisory Board, many of today's large architectural firms are multi-office, tied together electronically "so that anyone in the firm can work on any project seamlessly," he says. "Studio 305 will not only prepare young architects to work in this fast-paced information milieu, but also create a resource-rich, media-focused environment that will cause many of the past routines of the profession to be trivialized and allow the enhancement of the architect's role as creative consultant."

Studio 305 will give designers the ability to find, sort, edit, and use all the information available electronically from the Web, CDs, and international libraries. No longer bound by the limitations of two-dimensional drawings or three-dimensional models, students will have the power to create in the fourth dimension with animation software. Sophisticated prototyping tools will vastly accelerate the modeling stage.

"What we're doing," Mistur says, "is bringing everything closer to the fingertips and the mind of the designer, enabling design that is much more complex and immediate."

But Studio 305 will never be a "paperless" environment. It will also serve students and faculty who choose to work with entirely nondigital media. "The mix of the two—electronic work and physically trying things out for yourself—is very important. They complement one another," Mistur says.

*Institute funds to support programs in their infancy that relate to strategic concerns at Rensselaer
Lonsway agrees. "We're not interested in turning computers and simulation software into a fetish," he says. "We're hoping to achieve a natural balance by embedding computer training and experimentation in the curriculum at every level. Computing is now incorporated in the undergraduate curriculum like any other architectural tool, but to a highly unusual degree, beginning with the first-year studio."

That will give Rensselaer students a significant advantage. "We've found that there's usually about a five-year gap between the introduction of new technologies and their adoption by professional practices," says Mistur. "With the kind of experiences our curriculum offers, our graduates will already be proficient with the products most firms will just be starting to use. They're going to be very attractive to employers."

**The Man Behind the Vision**

Balfour's pledge to empower architects drives his vision. He has both the energy and the credentials to make it happen.

Born and raised in Edinburgh, a beautiful city that sparked his early interest in architecture and its relationship to political and social forces, Balfour earned a diploma in architecture at the Edinburgh College of Art. Then, as a Fulbright Scholar, he added a master of fine arts in architecture from Princeton. He has practiced in London and New York, served as dean of architecture at Rice University, and was director of architecture programs at Georgia Institute of Technology.

In 1991, when he was named its chairman, the Architectural Association School in London was facing serious financial problems. Balfour revised the curriculum, helped launch a capital campaign, and added new post-graduate programs. Four years later, student enrollment was growing, annual income had increased significantly, and a sizable debt was almost repaid.

At the same time, he completed his critical exploration of architectural activity in Berlin since the destruction of the Wall. His book, *Berlin: World City*, was awarded the AIA International Book Award for Urbanism for 1997. It was his second book to receive this honor.

"Alan has broadened our school's outlook," says Frances Bronet, associate professor and associate dean of architecture. "He looks at architecture as a very large project that includes issues of urbanism, global conditions, and the 'virtual' world, and yet he's also very interested in the more traditional questions like how do you make wonderful space. It has opened up all kinds of opportunities for faculty and students."

Balfour's approach is simultaneously broad, focused, speculative, and practical. "The school doesn't have an infinite number of ways to grow, so I have concentrated on what are the most clear and robust," he says.

**Building on a Strong Foundation**

Rensselaer, according to Balfour, has one of the strongest professional architecture programs in the nation (an accredited five-year program awarding professional bachelor's and master's degrees in architecture). Four qualities have distinguished it over many years, Balfour says — qualities that attracted him to Rensselaer and qualities he would instill in all its students.

First, it's a progressive design school. "We believe that architecture can help define and transform the culture. We encourage our students to dream. At the same time, we make them aware of the political, social, and ethical implications of the discipline." This agenda has been developed over many years, through the theoretical work of professors Peter Parsons and Kenneth Warriner.

Second, "We're a pragmatic school. We give our students both the theoretical understanding and the practical skills that enable them to make what they imagine." The Design Development Studio, led by professors Mark Mistur and Dennis Tanczos '90, has become a most rigorous design construction experience, Balfour says.

Third, the school's outlook is international. "With the creative efforts of the faculty, particularly professors David Bell and Nicole Pertuiset, Rensselaer has built strong international programs. This gives our students experience in a wide range of global issues." There are semester-long programs in Rome and India, summer programs in Turkey and Prague, an exchange program in Zurich, and plans for a program in Asia. A full 85 percent of the school's undergraduate students profit from these opportunities.

Finally, the school is ideally situated in a technological university. "In both our curriculum and our research we are using new technologies in ways that will have a profound effect on the future of the discipline."

Complementing these qualities are the distinct personalities of the faculty, led by Associate Dean Frances Bronet. "Frances is the soul of the school," Balfour comments. "Her love for the students, her work across disciplines, her irrepressible desire to expand the horizons and the experience of the students is invaluable."

**Developing New Areas of Practice and Expertise**

In response to a growing demand from professionals for highly focused expertise, the school is developing new post-professional degree programs in a range of specialized subjects that will take advantage of Rensselaer's technological strengths.
cation to architectural theory and practice. The ultimate objective is to develop new tools that will redefine the practice of architecture—embedding new elements and manipulating existing ones, such as human perception, environmental conditions, physical infrastructure—into artificial intelligence programs with which an architect can shape complex environments.

Like all "pure" research, no one knows precisely where these explorations will lead. "The power of these programs far exceeds the imagination of the people who designed them," Balfour says. "With them we will construct realities that will influence us in ways that we can only speculate about and in ways that will be structured outside any rules we've ever known." Balfour contends that architecture is one of the more obvious disciplines to explore these issues, "because it is the discipline formally concerned with the interrelatedness of multiple elements in space."

Intelligent Buildings

The School's Existing Strength in Building Sciences is Being Expanded at both the undergraduate and graduate level. A strong general program and highly specialized advanced degrees concentrating on and exploiting emerging technologies will be a major benefit to both the construction industry and the field of architecture, Balfour says. He points to Intelligent Building Systems, the cross-disciplinary post-professional degree being initiated by Professor Walter Kroener.

"Wally is weaving together all the things that we know and do in materials, in control, family and students." — Frances Bronet

These new master's programs, which will draw students from around the world, are modeled on the internationally respected Lighting Research Center's (LRC) master of science in lighting. Under the leadership of Director Mark Rea and his associate, Russ Leslie '80, the LRC is the major research center in the School of Architecture. Its research faculty includes as many architects as scientists.

"It's wonderful to see a scientist from Moscow, a theater lighting designer from St. Louis, an engineer from South America, and architects from Europe all coming together for a two-year program to learn the refined skills that will make them lighting experts," Balfour says.

"That's the model, but these new degrees will be limited to one year in residence. It's a more reasonable amount of time and money for the people who most want this kind of specialized program."


Informatics

Students in Lonsway's Informatics and Architecture will address the complex theoretical issues of spatial and simulation technologies and their application to architectural theory and practice. The ultimate objective is to develop new tools that will redefine the practice of architecture—embedding new elements and manipulating existing ones, such as human perception, environmental conditions, physical infrastructure—into artificial intelligence programs with which an architect can shape complex environments.

Like all "pure" research, no one knows precisely where these explorations will lead. "The power of these programs far exceeds the imagination of the people who designed them," Balfour says. "With them we will construct realities that will influence us in ways that we can only speculate about and in ways that will be structured outside any rules we've ever known." Balfour contends that architecture is one of the more obvious disciplines to explore these issues, "because it is the discipline formally concerned with the interrelatedness of multiple elements in space."

Sonic Architecture

Sonic Architecture — the creative application of electronic sound simulation and enhancement to architecturally defined sonic environments — is being developed with Christopher Jaffe '49, a world authority on architectural acoustics.

Among the other post-professional degrees being planned are Advanced Construction Management and Urban Technologies (in collaboration with Civil Engineering) and with Professor Donald Watson, Environmental Studies. These specialized degrees will all rely on and contribute to the new information technologies, and all will be conducted in the school's new studio-styled computing facilities.

Inevitably, all these activities, including newly emerging sponsored research opportunities, are enhancing the
undergraduate program and helping the school achieve its goal to increase undergraduate enrollment by 10 percent and to bring as many as 60 additional students into the graduate program.

Mega-Cities and the Global Classroom
ALL OF THE SCHOOL’S STRENGTHS—PROGRESSIVISM, PRAGMATISM, global outlook, and technological prowess—will be needed if its graduates are to successfully confront the challenges posed by the explosive growth of cities, particularly in Asia. Balfour is convinced this growth will be the most powerful influence on worldwide industrial and economic stability for the foreseeable future.

George List, chair and professor of civil engineering, Franklin Luk, chair and professor of computer science, and Balfour have allied themselves to address the issue. The formation of a research and teaching center focusing on urban infrastructure will attract students from around the world, List says, most of them, he expects, from mainland China, the Hong Kong delta, Malaysia, Indonesia, and Thailand. They will be joined by students from this country and elsewhere who want to study the intricate problems associated with extremely rapid urban growth.

The three schools committed to the endeavor—Science, Engineering, and Architecture—will approach the study of mega-cities from different angles, but, says List, “we share a common perspective. We all believe the best way to identify the trends and problems is with 3-D and 4-D visualization and simulation. This technology will help us understand how urban centers evolve, how the buildings and subways and highways and information systems are tied together, to visualize flows of materials and people, and to evaluate costs.”

“We’ve got to develop and exploit tools that will help us understand the implications of this kind of growth,” Balfour says. “These are immensely interesting and vital problems that are clearly central to architectural management—problems that only advanced technologies can help us resolve.”

A Knowing Imagination
“IT IS TROUBLING THAT ISSUES SUCH AS EXPLODING URBAN POPULATIONS and the synthetic manipulation of reality aren’t being adequately addressed,” Balfour says. “But I’m thrilled by the energy of these times because, in a sense, architecture is asked to give definition to an uncertain future. That’s what we do!”

“We need to cultivate knowing, informed imaginations with an awareness of the broad social, economic, political, and environmental forces at work in the world.

“We need to produce architects whose dreams of creating a better world are empowered by a command of technology.”

On Architecture
In addition to Berlin: World City, Balfour’s other books include Portsmouth; Rockefeller Center: Architecture as Theater and Berlin: The Politics of Order, 1737-1989 (winner of the AIA International Book Award for 1991). He has contributed to The Edge of the Millennium produced by the National Museum of Design, Smithsonian Institution, and Cities of Artificial Excavation: The Work of Peter Eisenman. He was co-editor of the essay collection Landscape Recovered. Balfour is currently working on a collection of essays tentatively titled Illusions, and is planning a major book on New York City, past and future.

On the persistence of architecture: “If architecture is all that remains when a culture fades away, it frequently leaves very little, and what survives can only provide an imperfect representation of those who built it. Yet, in its imperfection, architecture persists in touching the mind and placing the body in the world. A reality below the surface of things is continually felt, experienced, and interpreted. Experimentally, architecture can indicate the paradigms by which we choose to live—between the plowed field and the forest, between a forced march and the freedom to wander, between walking and running and rioting and dancing.”

On the Berlin Wall: “The Wall was . . . the most outrageous construction of Western civilization. Its simplicity had magnificence. It was the great barricade, the supreme testament to the power of dialectic, and the removal of the concrete of which it was formed will not remove the Wall from the mind.

“Reality will forever rest on the memory of this eternal division. Such essential order, once split, can never be fully restored. There will remain forever a flaw, a chronic weakness, in the foundations of all constructions in this place. Toughened by an inheritance of opposition and negation, new landscapes must emerge—landscapes capable of building, on such a disturbed base, bridges across the wound of the future.”

On the enabling power of architecture: “In a very simple sense, architecture does not merely provide the stage—it also presents the play. It controls our comings and our goings and it influences our moods and defines and constrains our activities. It is continually acting on us. Rather than remain mere actors, pawns in the web of naive or misguided imagination, we should ensure that the play responds to our needs and desires. We should demand an environment that is continually engaging us, magnifying our strengths and overcoming our weaknesses.”
Frederick Winslow Taylor (1856-1915) is known as the first efficiency expert and the father of scientific management. By applying the tenets of scientific management to the factories and industries of the Industrial Revolution, Taylor left a permanent imprint on all of American life.

"He helped instill in us the fierce, unholy obsession with time, order, productivity, and efficiency that marks our age," Robert Kanigel '66 writes in the prologue to The One Best Way, his new biography of Taylor. "Foreign visitors to America often remark on the rushed, breathless quality of our lives. Taylor... helped make us that way."

Slave driver, radical, visionary—Taylor has been called all three. His ideas were alternately embraced and abhorred. Yet there's no denying his impact.

"Today it is only a modest overstatement to say that we are all Taylorized," Kanigel writes. "From assembly-line tasks timed to a fraction of a second, to lawyers recording their time by fractions of an hour, to standardized McDonald's hamburgers, to information operators constrained to grant only so many seconds per call, modern life itself has become Taylorized."

As this excerpt begins, Taylor is working at Bethlehem Steel Company, where he has applied his methods to the work of yard laborers and has developed new high-speed steel cutting tools, which were to revolutionize the machine shops of the world.

BUT HOW TO EXTRACT from the new steel all its potential? Taylor's old problem, of how to use the metal-cutting data to set speed and feed for any particular job, had with high-speed steel become more urgent. You didn't want to use some safe, leisurely speed that let the tool cut merrily along, hour after hour, without regrinding; that was too conservative, robbing the new steel of its value. You wanted, rather, to push the tool to its limit. This meant, for a particular job, determining what that limit was—and fast. For with the cutting itself so rapid, you were cycling through each job more quickly now. Setup—swinging it onto the lathe, lining it up, clamping it down, setting speed and feed—consumed a larger proportion of each job and so offered more opportunity for waste; you didn't want to be figuring and reckoning when you could be cutting.

To hear Taylor tell it, for years he'd cast about for a mathematician who, "offered any reasonable fee," could take the tables, graphs, and curves that embodied the metal-cutting data and make speed and feed calculations quicker and more routine. Seven, by his count, had taken a shot at it. It can't be done, came their collective answer; there were just too many variables: the hardness of the metal to be cut, its diameter, the power the machine tool must furnish, the mechanical forces the tool had to bear, and many more. It might take a good mathematician two to six hours, Taylor estimated, to solve each problem, way too long to be of any use. At Bethlehem, Gaunt and another man had used a slide rule aimed at speeding up the calculations, but by the summer of 1899, they had achieved little.

Enter Carl Barth.

Four years younger than Taylor, Barth was a short, dark Norwegian with a scraggly little beard and, in one scholar's words, "keen, sharp, snapping blue eyes." He brimmed over with intelligence. He was honest, headstrong, rabidly individualistic, and a socialist; he said of millionaires, "I would rather see them drowned." Yet he was profoundly elitist and could say in the same breath, "I believe there are very few men who have a right to their opinions." One earned a right to them only through study and effort. Of opinions, he declared, "I have got mighty few; but by the Almighty, they are strong."

Barth was born in Christiania, now Oslo, and was probably living there when young Taylor and his family passed through in 1870 on their way up to the fjord country. When he was twelve, an older boy took him to visit a brass foundry's machine shop, where the sight of chips flying off candlesticks being turned enthralled him. When he got through school, he resolved, he'd work in a machine shop. His father, a university-trained forester, wanted him to attend the university in Christiania. But Barth held out instead for Norway's famously theoretical technical school at Horten, at the mouth of a fjord near the capital; he
was fifteen and, to hear him tell it later, the youngest boy ever admitted. From school, it was into the shop for what would normally have been a five-year apprenticeship. But he was already marked as prodigiously bright and when an instructor at the school quit, Barth was asked to take his place.

Friends would later recall how Barth could work out complicated gear trains in his head. Whatever he got near he wanted to reduce to graphs and formulas. In America, he studied mathematics on his own and in 1894 would present "The Principles of the Calculus in a New Light" before the Engineers Club of Philadelphia. He puttered with mathematical curves and equations all his life. And his talent for it was apparent to all, even in his teens.

Yet Barth made the equivalent of only three cents an hour at Horten and was forever getting into trouble with his boss. So, like many a troublemaker, he began studying English in earnest and emigrated to America, arriving in the New World on April 18, 1881. He wound up in Philadelphia, submitted examination drawings from Horten that impressed engineers at the William Sellers machine tool works in Philadelphia, and was offered two dollars a day to start in the drafting room. Soon he was making twenty a week.

At Sellers, he met Wilfred Lewis, an old friend of Taylor's. When, many years later, in 1899, Taylor cast about for help at Bethlehem, Lewis recommended him. Barth was working at an Ethical Culture school in New York at the time, teaching manual training and mathematics. "An opportunity has come up at the Works here," Taylor wrote him. "Can you not come over to Bethlehem in the near future and talk the matter over with me?" The two met. On June 15, when some of the yard laborers were threatening to strike, he reported for work. Word of trouble reached Taylor, Barth recalled, but "he did not betray the slightest perturbance," acting as if nothing had happened. Taylor put Barth to work on the experimental lathe under Merrick; Barth was a veteran machine tool designer, but to Taylor he was a novice and needed to get his hands dirty all over again.

Within a few months, Barth was doing what he'd been hired to do, pulling down twenty-five hundred dollars a year, and employed at what personnel records described as "calculations." "I shall never forget the intense delight evinced by Mr. Taylor one morning," Barth wrote later, on being presented a formula embodying results of the metal-cutting experiments. Soon, Barth had taken the primitive slide rule devised by Gantt and made it into one that coughed up answers almost instantly.

The ordinary slide rule, with its system of fixed and sliding scales, had been popular since around 1850 and remained so up to the 1970s, when its place in the engineer's affections was usurped by the pocket calculator. But while the typical slide rule was an all-purpose instrument, Barth's did just one thing, calculate speeds and feeds for a particular machine tool. Boasting five individual slides, it had to accommodate an enormous range of factors. The shape of the tool exerted an effect on cutting speed of 6 to 1, depending on whether you used a round-nosed tool or a pointed one, as in cutting a thread. Chip thickness, a factor of 3.5 to 1. The kind of metal you were cutting, whether soft or hard, 100 to 1. And, of course, whether you cut with high-speed steel or ordinary carbon steel, a factor of 7 to 1.

But with the Barth slide rule, you could slip through the calculations easily. Cutting speed had to satisfy two broad constraints: the machine tool's ability to exert power and the cutting tool's ability to bear it. Roughly, the rule's upper section dealt with the former, its lower part with the latter. Each, independently figured, gave a range of possible solutions. A check of the central scale revealed the one or very few solutions that satisfied both ends of the problem. All this in twenty or thirty seconds.

By the end of the year, the new Barth slide rules were being used with a dozen of the giant machine tools in Machine Shop No. 2. And their use, wrote Taylor, meant more than all the other metal-cutting improvements combined, because it achieved "the original object for which in 1880 [at Midvale] the experiments were started; that of taking the control of the machine shop out of the hands of the many workers, and placing it completely in the hands of management, thus superseding 'rule of thumb' by scientific control."

So readily did the slide rules furnish optimum settings, and so briskly did high-speed steel tools dispose of the work, that at least twice Machine Shop No. 2 was left with nothing to do. This was in sharp contrast to a time not long past when, to relieve the shop's backlog, the purchase of a million dollars' worth of new machine tools had been seriously contemplated.

The slide rule's success placed Barth squarely among Taylor's favored few. After the inevitable fighting between them had convinced Taylor that Barth knew what he was about, he became one of a handful of men from whom he could take criticism; sometimes Taylor introduced him as "the man who right along proves that every darned thing I have ever done is wrong."

Soon Taylor was pushing more on him. "Now Barth," he said, calling him into his office one day. "I want you to take these data we have here on laboring and try to work out the law." "These data" referred to studies of laborers loading 92-pound "pigs" of iron all day long. "The law"—in this case of human physiology—referred to Taylor's efforts, going back to his pioneering experiments at Midvale Steel in Philadelphia, to define a full day's work.

At least in Taylor's memory, Barth wanted no part of it. "I will not do it," he pictured Barth replying. "You are talking silly. Everyone will tell you so. Mr. Gantt, I say, or get out."

So Barth acquiesced, and Taylor piled the data on him. Maybe Barth figured, like everyone else, that there was 'some relation between feet-pounds, or energy, and a day's work'?

Taylor assured him that he had sought such a relation from the beginning, only to conclude it didn't exist; the "law" simply wasn't that neat. But he had not given up the search for something hard, definite, and quantifiable in the data amassed over the years. Gantt, Gillespie, and others urged him to forget it.
"But I was sure the thing was there," he would say, and now he wanted Barth to find it.

He was giving him everything he might need, Taylor assured him, "even the temperature of the day, the moisture in the air, anything that may in any way remotely affect what constitutes a day's work." Not so, concluded Barth. To him, the data were "so inconsistent that no use could be made of it," and he launched new studies. From these, together with the original data, he did find something.

One day, recalled Taylor, Barth "came back in a great state of excitement," the coveted law and he launched new studies.

Had Carl Barth not come along, Taylor would have had to order him up from Central Casting; Barth's son once called him "even more of a Taylorite than Taylor." For he'd helped restore to the Taylor system what had almost gotten lost in the roving years since Midvale—science. And not just science, but science wrapped in the flag of mathematics. With his help and that of Gantt and the others, he was fashioning a science of work. This science wrapped in the flag of mathematics, to problems of human work left virtually untouched by legions of workmen, foremen, and managers over the centuries.

Among the areas he probed was, of all things, shoveling, which, with pig iron handling, would one day furnish one of the two stories Taylor relied on most to impress his ideas on the public. "Now, gentlemen, shoveling is a great science compared with pig-iron handling," he would tell his inquisitors on the House Special Committee to Investigate the Taylor and Other Systems of Shop Management in 1912, no doubt pausing for appreciative titters.

Soon after arriving at Bethlehem, it seems, he'd looked out the office window and seen men shoveling rice coal—anthracite in nuggets about the size of fine gravel. Once they finished, "they walked to another part of the yard where there was a pile of ore from Mesabi, and with the same shovel they shoveled that ore." Now, a shovelful of rice coal might weigh four or five pounds, one of iron ore thirty-five pounds. Would the one shovel that Bethlehem yard laborers brought with them from home serve equally well for both? Might you not want larger shovels for lighter material, smaller ones for heavier?

Soon, Taylor's men were weighing the pile that a man shoveled in a day, dividing by the number of shovelfuls counted, and calculating an average weight per shovelful. Next day, they'd trim the edge of the shovel, to reduce the weight per shovelful, and note the effect on the day's output. Was there one best shovel load?

Taylor's interest in this simple art went all the way back to Midvale; his correspondence reveals remarkable intimacy with what most others had written off over the centuries as simple brute labor, unworthy of study. But now, at Bethlehem, Taylor took it further yet. He and his assistants collected data on shoveling from the body of the pile, from the dirt bottom of it, from a wooden bottom, and from an iron bottom. They timed even the backward swing of the shovel needed to throw a load a given distance. For four months this went on, the results reduced to tables and graphs.

Taylor had guessed the optimum shovel load at fourteen pounds, but the data clustered around twenty-one. That is, furnish a laborer with a shovel that, with a particular material, held about twenty-one pounds and, at day's end, you'd have a bigger pile than for a shovel holding any other weight. At one point, Gantt and Taylor almost came to blows when Gantt insisted that shovels big enough to hold twenty-one pounds of rice coal couldn't be had. Nonsense, said Taylor, the gain in using them would justify any cost or trouble to get them—even having them custom-made. They got them.

In the end, through time study, piece rates, and other measures, the cost for each ton of material handled in the Bethlehem yards was halved, and the place was being run as no such place ever had before. Taylor and his minions built a telephone system and hired clerks. They set up a bulletin board, along with big maps that let them plan the most efficient movements of men around the yard. A man reporting to work in the morning went straight to the shovel room, where he was issued one of ten types of shovels and told where to report. As Taylor testified, "It was practically like playing a game of chess in which the four to six hundred men were moved about so as to be in the right place at the right time."

Taylor's one best way had come to Bethlehem. Soon, it would spread across America and the world.

Robert Kanigel '66

Robert Kanigel '66 is the author of Apprentice to Genius: The Making of a Scientific Dynasty and The Man Who Knew Infinity: A Life of the Genius Ramanujan, a National Book Critics Circle Award nominee, Los Angeles Times Book Prize finalist, and New York Public Library "Book to Remember." He is the recipient of the Grady Stack Award for science writing and many other awards, and has written for numerous periodicals. He lives in Baltimore, where he teaches writing in the University of Baltimore's publication design program.

The One Best Way also has garnered positive reviews for Kanigel. "A superb biography... Kanigel... has given us another unlikely page-turner," said the Chicago Tribune. "Kanigel is a first-rate researcher and writer. He is also a marvelous storyteller, adept at placing events into social and historical context," said the Cleveland Plain Dealer. And, "Mr. Kanigel's richly detailed biography... shows how much drama there was in the mundane when Taylor was making it the stuff of a new 'science' of efficiency," said George Will in his front-page New York Times Book Review article.

If you can't find a copy of the book, contact Viking Publishing at (800) 253-6476.
Reunion '97

"It was a great affair." — Charlie Harper '37

More than 870 alumni and their families returned to campus June 5 through 8 to enjoy reunion festivities. Classes from '32 to '92 and every five years in between (with the exception of the Class of '52, which will celebrate next month) convened.

"I've been to a lot of reunions; I have to say that this was the best reunion I've seen," said Charlie Harper '37, who was pleased to greet 17 of his former classmates at a luncheon held in their honor.

Reunion events enabled alumni to reacquaint themselves with Rensselaer through campus and facility tours, "college for a day" classes, breakfasts with academic deans, and an address from President Pipes. Alumni also had opportunities to converse with current students who volunteered to host many events.

"The students were wonderful with all the TLC they provided for the old folks," said Harper.

All returning alumni came together at the reunion picnic and the colorful Parade of Classes, where each class annually competes to win the judges' favor.

Members of the Class of '57 placed a slide rule in the hand of their parade float, a model of the former mascot, the Bachelor, which they engineered out of tomato cages, chicken wire, and 3,000 cocktail and dinner napkins.

The Class of '72, clad in brilliant tie-dyes, staged a sit-in in front of the reviewing stand and beat out all other classes for best bribe, which included individual rock 'n roll mementos and the judges' favorite, personal backrubs from a woman carrying a back massager. The Class of '77 didn't let the viewers forget that disco helped define their era.

The Class of '92 drew the largest turnout for a five-year reunion in more than 15 years. "Our reunion was a resounding success!" said Gregg Nichols '92. "The people who came (both expected and surprise-shows) had a great time."
Class Notes Deleted for Privacy Concerns
The Rensselaer Alumni Association is pleased to announce the establishment of the Career Connection, a networking opportunity for graduates committed to helping one another explore professional interests and career alternatives.

Career Connection, operated out of Rensselaer's alumni office, will help put alumni interested in a particular field or industry in touch with Rensselaer graduates who work in those fields. Maybe you're considering a career change and would like to learn more about a different field. Or perhaps you plan to relocate and need advice on the job market in a region. Career Connections will try to help.

It's also a way to share your own work experiences, offer advice about job hunting, or suggest contacts for those seeking to enter your field.

To be a part of Career Connection, you will register with the alumni office, indicating your areas of professional expertise and the way in which you prefer to be contacted. The alumni staff will make that information available to inquirers. Only Rensselaer graduates will be able to make contact requests.

If you are interested in participating in Career Connection, contact Melissa Samuels, Heffner Alumni House, Rensselaer Polytechnic Institute, Troy, NY 12180, (518) 276-6910, e-mail samuem@rpi.edu.

The Perfect Job for You?
We're looking for the next director of alumni relations at Rensselaer. Even if your work experience does not include a university setting, your career skills might match our description of an ideal candidate:

- An energetic leader
- An enthusiastic advocate
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- A professional who is dedicated to Rensselaer's mission: educating the leaders of tomorrow for technologically based careers.

In this important university role, the director of alumni relations creates educational, career networking, and special event programming for alumni worldwide; leads and supports volunteer efforts on behalf of the Institute; partners with the Rensselaer Alumni Association board of directors to represent the Institute's almost 70,000 alumni; manages a dedicated staff to make it all possible.

Interested? Contact Robbee Kosak, Vice President for Institute Advancement, Old School 14, Rensselaer Polytechnic Institute, 110 8th St., Troy, NY 12180; kosakr@rpi.edu.

Moving?
We don't want you to miss a single issue of Rensselaer! If you've moved or are planning to move, please let us know your new address as soon as possible. You can e-mail us at alum.mag@rpi.edu or write to: Rensselaer Magazine, Office of News and Communications, Rensselaer Polytechnic Institute, Troy, NY 12180. Or call (518) 276-6531.
TROY — No, it wasn’t a sit-in or attempted coup. These students were part of an elite corps of students known as RenXchange. Their mission: to reach out to alumni and ask them to give to the Rensselaer Annual Fund. These are students who realize the valuable role the Rensselaer Annual Fund plays in supporting the needs of the Institute by helping to fund scholarships, academic programs, and investments in new technology.

1996-97 was the first year for the RenXchange team. Over 40 students participated, raising $200,000 for Rensselaer. This year even more students will take over the Annual Fund offices evenings from September to April, making over 30,000 calls. If you’re on the receiving end of one of those calls please take the time to listen to what they have to say about how the Rensselaer Annual Fund affects their lives and benefits your school.
CHANCES ARE, if you've been around for more than 170 years, you have a lot of history. At Rensselaer, we're proud of our history and of the history made by our faculty, students, and alumni. The new pictorial history of Rensselaer takes readers through 170 years of the building of the Institute, relating its growth to changes in society and illustrating the tenures of outstanding leaders who have shaped Rensselaer.

The coffeetable book is filled with rarely seen photos of the campus and Troy, and of the people who have made their marks upon Rensselaer.

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