PROPPELLING CAREERS

Students gain on-the-job experience with Rensselaer's Cooperative Education program

ALSO INSIDE:
Student Life in the Ricketts Era
An excerpt from the upcoming history of Rensselaer
ATTENTION: ENTREPRENEURS
WIN CASH AND THE CHANCE TO PITCH YOUR IDEA!

RENSSLEAER BUSINESS PLAN COMPETITION

The Center for ENTREPRENEURSHIP of New Technological Ventures in the Rensselaer School of Management announces the all-new Rensselaer Business Plan Competition.

If you are an alum, student, faculty or staff member with hopes of starting a business or plans to expand current business operations you could win a CASH PRIZE and pitch your idea to an audience of venture capitalists hosted by Rensselaer alumni.

Steve Kaplan '67, co-founder of Cypress Semiconductor; president of Cycle Time Associates; and 1995 Rensselaer Visiting Entrepreneur, states, "Many of us are asked to review business plans and invest in START-UPS on a regular basis. Why shouldn’t Rensselaer entrepreneurs get our bucks, if their plans reflect good opportunities? I’m really looking forward to working with the School of Management and with my fellow alumni on the launch of the Rensselaer Business Plan Competition."

For more information, CONTACT: Jane McCumber, Manager, Center for Entrepreneurship of New Technological Ventures, The School of Management, Rensselaer Polytechnic Institute, Troy, NY 12180, (518) 276-8398 or mccumj@rpi.edu.

More details will be available at the 1995 William F. Glaser ’53 Rensselaer Entrepreneur of the Year Celebration. Plan to attend on SEPTEMBER 29. Contact us for a program announcement and registration form.
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On the cover: Aeronautical engineering major Samantha Clemmons inside a wind tunnel at NASA's Langley Research Center (see story, page 18).

Blast from the past: turn to page 12 for a look back at the early days of Rensselaer.
Charting Rensselaer's Course

Adapted from President R. Byron Pipes' State of the Institute address to alumni returning for Reunion '95, June 9

Ralph Waldo Emerson once wrote that "an institution is the lengthened shadow of one man." I do not agree. At Rensselaer, we live among the long shadows of many great individuals whose ideas and work shaped this university to be unlike any other.

Rensselaer was the first technological degree-granting institution in the United States. In 1824 Amos Eaton taught an "experimental" education that featured laboratory experiments and hands-on learning. It was a practical, results-oriented education and its legacy has changed the world.

And indeed, Rensselaer is the lengthened shadow of many giants. Stephen Van Rensselaer, Amos Eaton, Palmer Ricketts, George Low. Giants of vision and of purpose, forging and sustaining Rensselaer's reputation as a premier technological university. Creating and charting a course of leadership in technological education and scholarship.

Just last year the Rensselaer community reaffirmed the Institute's central mission and wrote this simple, but powerful, mission statement: "Rensselaer educates the leaders of tomorrow for technologically based careers. We celebrate discovery, and the responsible application of technology, to create knowledge and global prosperity."

With this mission we remain true to Rensselaer's founding principles. Now, in 1995, we must continue in the proud tradition of our great leaders and chart Rensselaer's course for the generations to come. With the next century approaching and the global society changing so rapidly, the Institute must re-examine its priorities and secure its future.

Our community—and by that I mean trustees, faculty, staff, students, and many alumni—has spent this past year in a goal-setting process that began with a frank assessment of the many challenges facing the Institute at this time. Let me take you through some of those challenges now.

Along with all of higher education, Rensselaer has experienced rising costs, declining revenues, and increasing competition for students. In the last 10 years this extremely competitive environment has strained the Institute's well-being. Rensselaer balanced its budget by underinvesting in areas of critical—and recurring—need essential to our long-term viability.

This underinvestment has led to what we call a structural deficit—in some important areas we have "eaten the seed corn" instead of planting it for the future.

I am pleased to report to you today that Rensselaer has already taken the first steps toward addressing our financial concerns and eliminating the structural deficit. We have taken aggressive budgetary steps to bring expenditures in line with revenues. We are investigating opportunities for additional revenue through better utilization of existing resources. And, most importantly, we have launched a university-wide restructuring initiative to create more effective and efficient ways of doing business.

And I have important results to share with you! Already we have shortened cycle times for administrative processes, utilized electronic communication more effectively, and proposed many ideas for improving student services on our campus.

Nowhere is Rensselaer's total commitment to restructuring more evident than in the area of curriculum renewal. One of the university's first restructuring process teams investigated how we could deliver education more effectively at a fundamentally lower cost. The group has proposed a curriculum structure allowing students greater flexibility and depth, and already our faculty and administrators are at work planning for broad curriculum revision to be accomplished over the next three years.

The Rensselaer community has thoughtfully and carefully identified the Institute's needs, re-examined our priorities, and now we are ready to build on our strengths.

What are our strengths, our unique characteristics? The technological focus. The interactive classroom. The hands-on experience. The results-orientation. Value and
relevance. It is what I have been calling the Rensselaer Advantage.

It is clear that in the years to come Rensselaer will be called upon to continue to provide leadership in education and in technology. Now it is time for our community to articulate aggressive goals that will position our university with strength and vitality.

We have joined together to craft a detailed set of goals. For now, I will review with you the major themes and the overarching goals adopted by Rensselaer’s Board of Trustees on May 20, 1995.

Rensselaer’s goal-setting process will lead the university to the:

- Creation of a student- and learning-centered environment
- Attraction and retention of outstanding faculty and staff
- Attraction and graduation of the best and brightest students
- Pursuit of leading-edge pedagogy and scholarship
- Provision of financial security
- Enhancement of Rensselaer’s physical and administrative infrastructures

Rensselaer’s overarching goal is that goal most central to the Institute’s success—the elimination of our structural deficit by investing $25 million per year in these required needs by 2004:

- $4 million per year in financial aid for students
- $10 million per year in physical plant renewal
- $7 million per year in endowment
- $2 million per year in faculty salaries
- $2 million per year in academic program revision

Curricular Goals
Our curricular goals are designed to ensure that the Rensselaer curriculum addresses the significant technological issues of the 21st century effectively and efficiently. In essence, we will:

- Redistribute undergraduate and graduate enrollments to achieve program diversification
- Complete curriculum revision planning by 1998 with full implementation by 2004
- Make all first-year courses interactive in format and multidisciplinary in approach by 1998

Academic Goals
Our academic goals focus on the need for attraction, retention, and renewal of the Rensselaer faculty talent. We will:

- Provide competitive faculty salaries
- Evaluate faculty based on both importance of teaching and scholarly performance
- Establish endowed professorships
- Sustain external research support for scholarship

Student Life Goals
Our student life goals focus on the creation of a student-centered learning environment at Rensselaer where students are brought into full citizenship in the academic community. We want to:

- Increase student academic quality
- Increase percentage of women undergraduates
- Increase graduation rate
- Increase student satisfaction
- Increase diversity of student body

Campus Goals
Rensselaer’s campus goals provide for a campus physical infrastructure that will enrich and sustain our academic community’s learning environment. The goals call for Rensselaer to:

- Invest in deferred maintenance
- Implement information technology infrastructure
- Reduce paper transactions
- Strategically reduce campus space

Financial Goals
Our financial goals will provide the resources necessary to sustain the strength and vitality of the Institute in the 21st century. We will:

- Increase revenue through new programs
- Gain efficiencies through restructuring
- Receive funds through new giving to the Institute
- Increase the Institute’s net tuition income

These goals are realistic yet filled with energy and focus. The Rensselaer community has determined where we want to be and how we are going to get there. I ask all of you, as members of the Rensselaer family, to join with me to make our goals a reality. There is much to do, and we will need every one of you to make it happen.

If you would like to receive the full text of the President’s State of the Institute address, which includes the detailed goals, you may request a copy at president@rpi.edu or write to Editor, Rensselaer Magazine, Office of News and Communications, RPI, Troy, NY 12180.
February Freshman

Your article “Happy Birthday, Admiral Combs” in the June ’95 Rensselaer was just super. It was a thrill on Oct. 24, 1945 to hear him address our graduating class. Just one small correction, though. The class that graduated early was the infamous “February Freshman” Class of 1947—the first class admitted to RPI at midyear.

Many of the class will be attending the 50th Navy Reunion in October. Some will also be celebrating their 50th degree anniversary. A few will be celebrating their 50th anniversary of both their degree and commissioning.

Happy birthday, Admiral Combs! We wish you many more.

Richard Tietze
February Freshman
Class of ’47
Fripp Island, S.C.

We Had Culture!

I was somewhat dismayed by Thomas Phelan’s comment [“Answering the Call,” June ’95] that RPI was a “wasteland culturally” in the ’60s.

During my tenure at RPI from 1959-1965, the RPI Glee Club and Orchestra, under Joel Dolven, performed major works with surrounding colleges at the Troy Music Hall and in New York City. The band, under Olin Niles, performed both as a pep band and as a symphonic band. Ed Johnson organized the RPI Wind Ensemble, which rivaled the Eastman organization.

The RPI Players moved from the old playhouse at the foot of the Approach to the 15th Street Lounge, to handle larger audiences. There was an IFC SongFest, and probably lots of other things that I’ve forgotten.

A “wasteland” indeed!
William G. Tuel Jr. ’62
Kingston, N.Y.

Class of ’70 Position Surprising

I have just finished reading the article in the March ’95 issue of Rensselaer concerning the Class of ’70. I am rather surprised that Rensselaer students were so opposed to the Vietnam conflict. I distinctly remember signing a widely circulated petition to President Johnson during my senior year urging a commitment to complete victory using nuclear force if necessary. It is unfortunate that this mindset did not prevail. Had the United States followed this course, countless American lives would have been saved, and the reputation our nation would have thereby established would prevent us from now being bullied by Saddam Hussein and his ilk.

John Hazel ’65
Deatsville, Ala.

Careers in Patent Law

I was delighted to read the article by Ellen Katzman [“Patently Unobvious,” March ’95]. It will help alert the student body and our many graduates about the role the United States patent system plays in technological innovation and progress.

I would like to offer two comments about the article, one on some changes about to occur in U.S. patent law, the other on career opportunities for our students.

First the changes. The article correctly points out that the term of a U.S. patent is 17 years from the date of issue. But the recently enacted legislation implementing the provisions of the General Agreement on Tariffs and Trade (GATT) contains a myriad of dramatic changes to U.S. patent law. Two of those changes relate directly to material in the article: the duration of patent term and the speed of the patent application process.

As of June 8, 1995, the term of any patent granted on an application filed on or after that date will be 20 years from the date of filing an application, not 17 years from the patent issuance date.

This new 20-year duration of the patent measured from the date of the application will dramatically affect the speed of the application process. Now the patent applicant will want to move the process forward with as much dispatch as possible. Every day that passes during the application process will be one day less of effective patent term when the patent could be generating royalties.

The article also portrayed the Rensselaer graduate as the prospective patentee. Though many of our graduates no doubt will end up as the owners of many successful patents, I hope that RPI students will consider the many ways they can use their technical training in rewarding and satisfying careers.

Laurence R. Heeter ’57, ’60
Washington, D.C.

Rensselaer wants to hear from you. In order to provide space for as many letters as possible, we often must edit them for length. Please address correspondence to: Rensselaer, Office of News and Communications, Rensselaer Polytechnic Institute, Troy, NY 12180, or e-mail at alum.mag @rpi.edu.

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David Low Urges: ‘Don’t Be Afraid of Failure’

Astronaut Speaks to Rensselaer’s 189th Graduating Class

Astronaut G. David Low told graduates that the honorary Doctor of Engineering degree he had just received is an honor he will cherish forever because of the importance of Rensselaer to his father, George M. Low ’48, Rensselaer president from 1976 to 1984.

Rensselaer awarded 1,040 degrees to its 189th graduating class at the Houston Field House May 19. Low was invited by the class to be the commencement speaker.

Warning the graduates that there is no way to know where their careers will lead them, Low said that if anyone had predicted in 1948 that “my father would one day be instrumental in putting a man on the moon and returning him safely to Earth, I’m sure that person would have been thought of as being crazy.”

Low said his father was able to accomplish this feat because of what he learned at Rensselaer: “knowledge and thoroughness.”

Instead of predictions, he offered the graduates some advice: “You can’t be afraid of taking risks, and you shouldn’t be afraid of failure,” he said. “... I think in our country today, in many cases, we are afraid of taking risks because we are afraid of failing.”

When President John F. Kennedy proposed and Congress accepted the goal of sending a man to the moon, most of the needed technology did not exist, he said. And yet, the country reached that goal in just eight years.

“... The important thing here is that back then, 34 years ago, we did not have the technology, but we had the will,” he said.

“Well, standing before you today, I can tell you that we have all of the technology that is required to send a human being to Mars and return that human being to Earth safely... But I’m very sad to say that I don’t believe we could do it in eight years, the way that we do things today. In fact, I don’t believe that Congress could finish debating it in eight years. ... The difference today is that today we have the technology, but we lack the will. That has got to change.”

Low is the manager of the NASA Extravehicular Activity (EVA) Project Integration and Operations Office. He is a veteran of three space missions and has logged more than 714 hours in space, including nearly six hours on a spacewalk. He was mission specialist in 1991 on the nine-day Atlantis flight and payload commander on the 1993 Endeavor mission.
HELP FOR WORK-STATION USERS WITH LOW VISION

People with low vision who have found it virtually impossible to read the text at computer workstations in universities or on the job now have the help they need, thanks to computer science doctoral student Richard Kline and Ephraim Glinert, associate professor of computer science.

Products that address these needs have become widely available for personal computers, but the cost can run as high as a thousand dollars, according to Kline. For workstations where MIT's X-Window System commonly drives the graphics interface, viable low vision options have been few.

Glinert and Kline developed "UnWindows," computer software that can enlarge workstation computer text and graphics as much as an inch or more. It is available free on the Internet.

This new set of tools includes Dynamag and Coloreyes, which selectively magnify both text and graphics and keep track of the tiny mouse pointer.

"These tools could help anyone whose visual acuity is getting worse simply because of age," says Glinert, who himself was born with such limited vision that he must hold an ordinary newspaper just inches away from his nose.

Glinert and Kline developed UnWindows with support from the National Science Foundation. The researchers are now at work on an enhanced version for the blind and for the hearing impaired.

UnWindows V1 can be downloaded to any workstation account without charge from the address ftp://ftp.cs.rpi.edu/pub/unwindows/.

Incubator Program Honored

The Rensselaer Incubator Program, a major component of the School of Management, received the 1995 Randall M. Whaley Business Incubator of the Year Award, presented at the Ninth National Conference on Business Incubation in Scottsdale, Ariz.

Sponsored by Coopers & Lybrand L.L.P. and the National Business Incubation Association (NBIA), the Incubator of the Year Award recognizes overall excellence in business incubation programs. An independent panel of five NBIA members rated nominees on economic impact, graduation of tenants, tenant successes, service programs, and contributions to the industry.

Rensselaer's incubator is managed by the Center for Entrepreneurship of New Technological Ventures.

"The strong partnership between the incubator and Rensselaer is the most distinguishing attribute of the incubator," says Glenn Doell '82, incubator director. "This unique tie enables us to offer various resources such as students, faculty, alumni, and facilities to the businesses participating in the incubator. Our students learn theory in the classroom, and then work on field projects for course credit as consultants for the incubator's business clients."

Precision Valve and Automation Inc., a client company in the Rensselaer incubator, was named a 1995 Incubator 'Tenant of the Year.'

Through the Incubator Center, Precision Valve got startup assistance from Rensselaer's Center for Advanced Technology (CAT) in Automation and Robotics. Using Rensselaer staff researchers and graduate assistants in the university's entrepreneurship programs, CAT helped the company with the development of its first automated systems.

Precision Valve's founder and president, Anthony Hynes, works in his company's lab in the incubator facility in Watervliet.
**Personal Space Travel Could Be Reality**

In a major breakthrough, Rensselaer graduate students have successfully tested a revolutionary approach to aerospacecraft propulsion that may someday enable vehicles to ride an "energy beam highway" to space.

"We are a major step closer to proving that affordable, hypersonic aviation and space travel by private individuals for business or pleasure could ultimately become a reality," says Leik Myrabo, associate professor of mechanical engineering. Myrabo has been working on ultra-lightweight spacecraft, boosted by lasers and microwaves, for eight years with funding from NASA, the Air Force, the Strategic Defense Initiative, and the Space Studies Institute.

With Professor Henry Nagamatsu, who has played an important role in American rocket and spacecraft design since the 1950s, graduate students Jack Marsh and Don Messitt tested the "air spike" concept in Rensselaer's hypersonic shock tunnel. The test was successful at Mach 10 - less than the speed needed to bring a spaceship to orbit, but fast enough to show that the concept works, they say.

In the air spike system, focused microwave beams create shock waves ahead of the spaceship to drive the air out of the vehicle's path. These shock waves act as an efficient hypersonic inlet for the craft's air-breathing magnetohydrodynamic fanjet engine.

This unique approach to aerospacecraft propulsion means that the ship does not need to carry heavy, dangerous tanks of on-board chemical fuel.

Scientists, engineers, and government officials are beginning to realize that the aerospaceplane and similar launch vehicles that depend upon on-board fuel systems are too heavy and expensive and may never be an affordable approach to routine access to space, according to Myrabo. Many also believe that chemical fuels are simply not energetic enough for this purpose.

But a personal "lightcraft" could be in our future, says Myrabo. The inflated, lens-shaped craft would weigh less than a small automobile (1,200 lbs.) but would cover one side of a tennis court (33 feet in diameter).

Powered by space-based microwave transmitters, the craft could speed people from New York to Australia in 45 minutes or take visitors on a trip to the moon in five and a half hours.

"Put simply, this air-breathing machine would fly on safe, affordable, renewable microwave and solar sources along an energy beam highway," Myrabo says.

The Rensselaer tests also show that, with the air spike system, the shape of an aerospacecraft is now irrelevant. Drag and heat transfer are dramatically reduced, and there is no longer a need for sleek, slender-bodied vehicles.
Creating the Computer Playwright

Composer Neil Rolnick has found a way to keep his newest dramatic concert work fresh, and to get himself out from behind the conductor's baton at the same time. Working with students and colleagues on the faculty at Rensselaer, where he heads the arts department, Rolnick has developed what is believed to be the first use of a computer system to create a stage play and direct human performers presenting it.

The work, titled Home Game, is set in a post-revolutionary New York City, racially and economically polarized and at war with its suburbs. Working within this "world," the computer system creates a plot, script, and score based on predetermined sets of characters and circumstances and libraries of dialogue, melodic material, and pre-recorded video and sound.

In performances of Home Game, two actors and five instrumentalists, including Rolnick, work on a stage surrounded on three sides by rear-projection video screens. Two screens show the script, score, and stage directions. The third, main screen displays images from a video-disc player, including environmental images, text to be read by the audience, and images of characters who interact with the actors, plus real-time images of the actors.

Before each performance, Rolnick runs a control program called GameWorld – each time with a slightly different startup state. As musicians and actors prepare to take the stage, the computer writes the plot, script, and musical arrangement for the performance. Then the computer directs the show.

GameWorld, the program behind Home Game, was designed by David Porush, a professor of literature at Rensselaer, as part of a long-term project in computer-generated fiction. The program generates stories from a predefined "world" that includes history, geography, and characters who may appear in the story.

Home Game premiered as part of the Interpretations Series at The Kitchen in New York City in June.

Entrepreneurship Scholar Named to Management Chair

S. Venkataraman, an internationally acclaimed scholar in entrepreneurship, has been named Warren H. Bruggeman '46 and Pauline Urban Bruggeman Distinguished Associate Professor of Management at Rensselaer Polytechnic Institute.

A citizen of India, Venkataraman most recently served for six years as Paul Yeakel Term Assistant Professor in The Wharton School of the University of Pennsylvania, where he taught graduate courses on entrepreneurship and corporate venturing. He previously taught at the University of Minnesota.

Venkataraman is associate editor of the Journal of Business Venturing and has written extensively on entrepreneurship, corporate venturing, business policy and strategy, new technology adoption, and emerging economies.

Venkataraman holds a master's degree in economics from Birla Institute of Technology and Science in Pilani, India, and an MBA degree from the University of Pennsylvania.
from the Indian Institute of Management in Calcutta. In 1989, he earned a doctorate from the Carlson School of Management at the University of Minnesota.

"We believe that adding Venkat to our already well-recognized faculty and activities in entrepreneurship makes us one of the top three business schools, if not the top business school in this field," says Joseph Morone, dean of the Rensselaer School of Management.

"Venkat is an outstanding scholar, an inspiring teacher, and a genuinely nice individual," Morone says.

The Rensselaer School of Management focuses its undergraduate and graduate education on the intersection of management and technology with an emphasis on technological entrepreneurship.

President Emeritus Roland W. Schmitt returned to campus May 19 to unveil his presidential portrait, which now hangs in Sage Dining Hall. After comments from President Pipes and other campus representatives, Schmitt and his wife, Claire, unveiled the portrait and be offered a few words. Artist Clifford Schule was commissioned to do the painting.

alumni. The Office of Alumni Relations and University Events home page [http://www.rpi.edu/dept/alumni/maintpg.html] offers alumni the latest news about reunions and other alumni events.

Job seekers can find help at the Career Development Center home page [http://www.rpi.edu/dept/cdc/]. The CDC page provides access to on-line job databases across the country as well as the latest job announcements here on campus.

Can't get enough Rensselaer hockey? Check out the men's hockey page at its new address [http://www.rpi.edu/dept/athletics/m_hockey/]. The page offers news clippings, team and individual records, and an introduction of next year's incoming class; plans are under way to offer baseball, football, and women's varsity hockey information as well.

The latest campus news is available in on-line editions of The Poly, Review, and Rensselaer. All three publications link off the publications home page [http://www.rpi.edu/CampusInfo/publications.html].

In addition to these Web offerings, alumni also can stay in touch with the Rensselaer community through a number of Usenet Newsgroups available through the Rensselaer Alumni News Network (see page 48). The network sponsors groups for general interest and sports and allows users the opportunity to create new discussion groups on any subject.
LIGHT CONVERSATION

A cameraman films, as producer David George of CNN's Future Watch interviews Robert Davis, director of the National Lighting Product Information Program at Rensselaer’s Lighting Research Center (LRC). The CNN crew from Atlanta spent a day in May at the center’s facility in Watervliet as they prepared reports on the future of lighting. The LRC is part of the School of Architecture.

Sludge Proven Safe as Landfill Cover

Rensselaer's geotechnical centrifuge has helped prove that sludge from paper mills can safely replace clay as a cover for landfills that are being closed.

Thomas Zimmie, professor of civil engineering, had worked with officials in Hubbardston, Mass., to monitor an experimental project in which a landfill was covered with sludge from a local paper mill. He has been collecting data for five years, finding no unusual problems.

Working with a local engineering firm, Zimmie is now helping evaluate a landfill closure in Corinth, N.Y. Local officials wanted to use sludge from a nearby International Paper Co. mill as a barrier cover. While substituting sludge for clay had been approved in a few states such as Massachusetts, it had never been approved by New York state officials, who were concerned that problems could develop over time.

Zimmie used Rensselaer's geotechnical centrifuge to spin samples of clay and sludge at a speed that created 105 g’s -105 times the earth's gravity. Twenty-four hours at this pressure simulates about 30 years of water flow through the sludge under normal conditions, Zimmie explains.

The experiments confirmed Zimmie's earlier observations that sludge is more permeable than clay at first, but it is much more compressible. This means that over time, it becomes far less permeable and meets regulatory standards for landfill barrier covers. Use of the centrifuge also allowed Zimmie to collect sufficient leachate that had infiltrated through the sludge to complete extensive chemical tests.

These tests helped win regulatory approval for the Corinth project, which Zimmie described as a win/win situation. International Paper provides the sludge, saving the community the $10,000 to $30,000 per acre it would normally pay for clay cover. The company recently built an expensive new landfill for sludge disposal and wants it to last. Donating sludge provides a cost-effective alternative for getting rid of the material.
Walker Watch

The Walker Laboratory renovation is well under way. The oldest chemistry building on campus, Walker now boasts the beginning of new additions on its east and west sides. Recently, beautiful arched windows were installed looking out to the west.

The renovation is part of the renewal of Rensselaer’s historic “green-roofed campus,” although at present, the copper roof is as shiny as a new penny!

In addition to modern support systems, the refurbished Walker Lab will include state-of-the-art teaching laboratories for the interactive learning portion of the chemistry program.

The schedule indicates that Walker will be ready for teachers and students for the 1996 spring semester.

The new east tower addition to Walker Lab in progress (above) and as envisioned in a computer-aided drawing (below). The tower will include “resource rooms” that feature a lounge, conference room, tables, and computers. The spaces are designed to encourage conversation among students and faculty.
First, there was History of Rensselaer Polytechnic Institute, published in 1914 by P.C. Ricketts.

Next came Education for a Technological Society: A Sesquicentennial History of Rensselaer Polytechnic Institute, written in 1968 by Samuel Reznick, a former Rensselaer history professor.

And now (in the final stages of production), there is a pictorial history of Rensselaer Polytechnic Institute, titled Rensselaer: Where Imagination Achieves the Impossible. Thomas Phelan, former dean of Humanities and Social Sciences, Carl Westerdahl, former dean of students and director of alumni relations, and writer D. Michael Ross collaborated on the coffeetable book, which includes more than 150 historical photos.

Both text and photos propel the reader 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 book is filled with rarely seen photos of the campus and Troy; presidents, faculty members, and students who have made their marks upon Rensselaer; and even some of the more “light-hearted” student pursuits such as flag rushes and GM Week revelry!

Rensselaer magazine is proud to offer you a sneak preview of Rensselaer: Where Imagination Achieves the Impossible. The following excerpt comes from chapter three, titled “Rebirth.”

As the nation moves into the 20th century, the increasing need for industrialization places great demands on the technological institution. While the number of students attending Rensselaer continues to grow, so too does the need for an organized outlet for youthful energies. More and more “student life” programs are put into place, traditions start to develop, and President P.C. Ricketts leaves his indelible mark on the Institute.
Palmer Chamberlaine Ricketts was named director in January 1892, amid general approval. At the mid-winter alumni dinner the following month, graduates acclaimed the choice, and thus began one of the most extraordinary 40-year periods in the history of the Institute.

First as director, and then as director-president, Ricketts put his personal stamp on the character and appearance of the Rensselaer Institute just as surely as Eaton, Van Rensselaer, and Greene had before him. Gradually at first, then with increasing confidence, Ricketts accumulated virtually all decision-making powers, and then used that composite power to transform Rensselaer.

By turns eccentric, brilliant, dictatorial, and visionary, Ricketts over the next four decades would bring about—almost entirely through the force of his distinctive personality—the rebirth of a venerable but beleaguered institution, install it in a beautiful new campus, expand the curriculum with the addition of modern educational offerings, and lead it toward a financial stability that had been elusive up to that point. He was, in every sense of the word, a Rensselaer "original": strong-willed, brilliant, and with a superb sense of timing in terms of institutional and societal needs...

Slowly but surely, over the course of the next decade, Ricketts won the confidence of students, trustees, faculty, and alumni with his combination of deeply conservative and diplomatic approaches to problem solving, combined with impressive planning skills. In the back of his mind was a program of broad and sweeping action that would result in the rebirth of Rensselaer. But that would come in due course.

In the next few years, until the outbreak of World War I, Rensselaer under Ricketts undertook a new type of expansion to serve the extracurricular needs of a growing student body. Enrollment grew from 200 to a peak of 1,700 during the Ricketts era, corresponding to the increasing demand for engineers in an industrialized society. The "1886" athletic field and the "1887" gymnasium, named after the classes that financed them on the occasion of their 25th anniversaries, were dedicated in 1911 and 1912.

Student traditions were also evolving. Early in Ricketts' directorship, the Main Building had been an early focus of "rushes" between freshman and sophomore classes. One of the most frantic was the flag rush. The freshmen hid their flag on a Friday, and the sophomores had 24 hours to discover and seize the flag. On one occasion, the freshmen planted the flag on the steep roof of the Main Building, and the Troy newspapers reported "a bloody battle for it between more than 130 men. The building's banisters were broken and injuries were suffered, but the sophomores finally got the flag and marched through the streets of Troy with fife and drum corps."
In subsequent years the classes went to even greater lengths, planting the flag on islands in the river and engaging in boat-landing battles.

Student election customs were well established by 1883. On May 26, 1883, the students selected William A. Aycrigg Grand Marshal. The students then headed into the streets and, led by a band, paraded through the city, with fraternity houses illuminated by bonfires. The aggregation stopped at Boughton's hat store, where they presented the new Marshal with a silk top hat. The top hat is still used today as a symbol of the office.

Another ceremonial student ritual surrounded the "Burning of Descriptive" by the junior class, and the corpse was represented by S.F. "Windy" Warren's Projections of Descriptive Geometry. This had evolved by the end of the century into a "Cremation of Calculus," with a torch parade, a band, and a bonfire of Bowser's Calculus, which became the highlight of the academic year. The "Cremation of Calculus" took place, in one form or another, at Yale, Columbia, and Rutgers Colleges as well. The custom persisted well into the 20th century.

A more academic custom was the junior and senior geological tours, which usually occurred in the spring and summer. For a week each year, a sizable group of Rensselaer students, bent on fun as well as work, descended on a rural town, usually receiving notice—not always favorable—in the local press. In 1887, the Middletown, New York, Argus reported the arrival of 42 students, singing "lively student songs...thoroughly equipped for a rough pedestrian tour."

These tours were replaced in the 1890s by summer railroad surveys in the isolated countryside, which furnished occasions for student work and play particularly adapted to the outdoor nature of engineering practice at the time. These tours helped develop esprit de corps, and contributed to the stereotype of the rough-and-ready engineer.

The growth in enrollment under Ricketts saw the development of more orderly channels for student activity and organization. A Rensselaer Union, responsible for all student social and athletic activities, had come into existence in 1890, but it languished. In 1906, under the stimulus of a group of alumni, a movement by the RPI Young Men's Christian Association to provide a clubhouse on the new campus helped revive the dormant Union, and in 1908, the two merged.

Ricketts—whose view of appropriate student activities did not extend much beyond hard work in the classroom and laboratory—surprisingly endorsed this movement. Thus began the first officially organized and recognized student association on the Rensselaer campus—one that endures to this day. Its officers were the Grand Marshal and the President of

"Rushes" were a popular practice during the Ricketts era. Here, the freshman class of 1914 challenges the sophomore class to find its flag—placed on a building in the middle of the Watervliet Reservoir.
the Union, and by 1912, its support was assured through the introduction of a compulsory student fee of $5 per year. The Union became Rensselaer’s principal student organization under whose auspices were gathered the athletic activities, publications, and musical interests of the Rensselaer community. It occupied the Student Union Clubhouse, first located in the Warren mansion at the west end of ’86 Field, and later relocated to what is today the Lally Management Center.

A Student Council came about in 1910, as an outgrowth of a confrontation between students and administration. In October 1909, sophomores defaced the rocks overlooking the new 1886 Athletic Field with the numbers 1912—their anticipated graduation year. Incensed, Ricketts immediately closed the field and suspended all athletic activities during the football season. A general uproar ensued, and students held mass meetings and formally protested. Negotiations with Ricketts resolved the situation amicably, and out of these discussions came a proposal for a permanent Student Council to represent student interests. In 1912, the Student Council established Phalanx, a student honor society composed of leaders in various nonacademic extracurricular fields.

Another indication of enrollment growth was the proliferation of fraternities. Fraternities played an increasingly important and practical role, especially after 1912, when they began to acquire houses. Between 1900 and 1938, the number of fraternities grew from 8 to 23 chapters, including both national and local organizations.

Intercollegiate athletics also flourished. The principal sports had made their appearance haphazardly in some form by 1902. Baseball was the first, as far back as 1867, followed by football in 1874, basketball in 1896–97, hockey in 1901, and track in 1902. As early as 1906, the trustees approved, with reservations, the encouragement of athletics, but did not “intend such use to in any way interfere with the high standard of scholastic work required of students.” Games were to be played only between 5 PM on Friday and midnight on Saturday. The trustees also approved Rensselaer’s membership in the Intercollegiate Athletic Association. But even in 1906, football had no

The 1908 track squad collected many honors, including a special banner for a victory over Trinity.
special coach, and the team competed against both colleges and athletic clubs. Among the former were Rochester, Hamilton, Middlebury, and Stevens—and only one, the game with Hamilton, was a victory, while two were ties.

In the face of this mediocre record of intercollegiate athletics, Ricketts expressed a preference for intramural athletics for all students. However, he could not conceal his lukewarm attitude toward athletics in general, emphasizing that medical and law schools had no intercollegiate athletics, and that MIT managed quite well without an athletic program.

Other student organizations continued to flourish at Rensselaer. After 1900, a variety of urban and regional clubs made their appearance, testifying to the national character of Rensselaer’s enrollment. A Southern Club, as well as a Buffalo Club, existed in 1908, to which were added Connecticut, Vermont, New Jersey, and Western Clubs.

There were clubs with obvious objectives: the Scholarship, Rifle, Aero, and Dramatic Clubs. The last, appearing in 1896, was reorganized in 1921, and again in 1929, as the RPI Players, acquiring its own theater in the reconverted old gymnasium at the foot of the Approach. This organization has consistently presented excellent productions by capable student actors, directors, scene designers, and lighting experts, ever since.

Professional societies were initiated in the engineering departments, under the guidance of the faculty, as student branches of the American Society of Civil Engineers, the Society of Mechanical Engineers, and the Institute of Electrical Engineers. Musical interests among students were exceptionally strong, as evidenced by the Glee Club, the RPI Symphony Orchestra, and the RPI Band, which played at athletic events.

Further evidence of the growth of collegiate esprit de corps was the composition, collection, and publication of Rensselaer songs. In 1906 there appeared in the Transit what came to be regarded as the alma mater, “Here’s to Old RPI,” with words and music by Edmund Fales, a graduate and an assistant on the faculty. At the start, the song did not command great enthusiasm, and some criticized it as unsuitable, but the song caught on, and no adequate substitute was ever found.

In one respect, Rensselaer under Ricketts experienced a change that indicated a desire to assimilate the customs of more traditional American colleges. The class of 1908 was the first to graduate in the black academic cap and gown—rather than suits—and the faculty robed as well. The time of commencement also changed from evening to a daytime hour, and in 1913, the ceremony moved to the new “1887 Gymnasium” on the campus, breaking one more link with the city of Troy, where commencement had been held at the Market Block Hall or Music Hall for many years.

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The construction of the '87 Gym in 1913 allowed commencement ceremonies to be held on campus.

The three authors, who have immersed themselves in Rensselaer's past while preparing this collectable book for publication, have agreed to go on tour armed with images and tales. Look for D. Michael Ross, Thomas Pehan, and Carl Westerdahl at an alumni meeting near you! See pg. 42 for more details!
Samantha Clemons talks with her supervisor outside the wind tunnel at NASA's Langley Research Center.
CHECK

For 50 years, Rensselaer's Cooperative Education program has been giving students a taste of the real world.

Like snapshots in a family photo album, co-op students flash through Rensselaer Cooperative Education Director Diana Leis Delker's mind.

• In the ballroom-sized wind tunnel at NASA's Langley Research Center in Virginia, Rensselaer senior Samantha Clemons adjusts the wing tilt of an F-18.

• At Burroughs Wellcome Pharmaceutical Company in North Carolina, junior Amy Piatek performs preclinical trials on drugs for the FDA.

• Fourth-year architecture student Brian Kaufman examines the plans for the new Greater Buffalo International Airport at the offices of Kohn Pedersen Fox Associates in Manhattan.

• In Albany, doctoral student Susan Mings puts the finishing touches on a multimedia program that will guide Key Bank Services employees through the new banking applications software.

• Management students are placed in assignments from Denis Lussier '88's New Jersey-based computer consulting company, Fusion Technologies Inc.
These students are the newest photos in her album of memories that stretches back almost 15 years and includes more than 3,000 faces of students whose lives Delker and her staff have touched.

No two images are the same. "Each student is unique and has special gifts—and each co-op job is unique and holds special challenges," explains Delker.

But despite the personal differences, the goals are the same. Cooperative education is an on-the-job, real-world experience that "allows students to confirm academic majors, explore career opportunities, and enhance personal growth," says Delker.

That's Why They Call It Research

When Amy Piatek decided, in her sophomore year, not to go to medical school, she short-circuited her carefully planned career path. As a biology major, her most attractive remaining options were research into disease or work in the drug discovery process.

"I was nervous about what would happen if I didn't like research," says Piatek. "I didn't want to teach biology."

She needn't have worried. The exacting and demanding work of drug research in her co-op placement at Burroughs' research laboratory was everything she had hoped.

"I found myself there at 7 o'clock in the morning," says Piatek, "and I stayed until everyone left—because I loved it so much."

On a typical day, she painstakingly fills 96 tiny wells with blood samples, adds chemicals, and monitors reactions. Each computer data run becomes a cliffhanger, she says. "You hit the button for results and hold your breath."

When things go sour, it can be frustrating, Piatek warns. "Many times I would work on something for hours, just to throw everything in the garbage."

After a day like that she would need to be reminded by her supervisors about the unpredictable nature of the job. "That's why they call it research," they would chide her.

Her experience at Burroughs brought her in contact with a wide range of researchers with varying educational backgrounds. "I realized that more schooling was definitely necessary."

Next year she will attend Columbia University graduate school on a fellowship.

"I honestly believe without this experience, I wouldn't have gotten into Columbia. I was up against people who had been out of school four or five years working in the research field," Piatek says.

"Columbia is investing a whole lot in me. And they don't want people who quit after a year because they hate being in a lab."

Aeronautical engineering student Samantha Clemens always knew she wanted to work in a space-related field. Her high school experience at Space Camp just confirmed it.

"It is important to give yourself a chance to see if what you're in school for is something you really want to do over a long period of time."—Samantha Clemens

But, says Clemens, "It is important to give yourself a chance to see if what you're in school for is something you really want to do over a long period of time."

So she opted for co-op at NASA's Langley Research Center in Virginia. Choosing just the right screw for a prototype that would measure skin friction; watching the computerized image of a hypersonic jet engulfed by a shock wave; poring over computer-generated plots; Clemens had a front-row seat for each phase of flight research from design to analysis.

After her fourth tour, she had confirmed her career choice, made some valuable friends in the field, and returned to classes motivated and energized. "Toward the end of co-op you actually look forward to returning to classes to learn more so that you can better understand what was going on at work," she adds.
For fifth-year architecture student Brian Kaufman, co-op was a chance to get some in-depth architectural experience.

Architectural projects typically stay at an office for a couple of years so “even people who had summer jobs weren’t at a place long enough to get deeply into a project,” says Kaufman.

But Kaufman’s eight months at Kohn Pedersen Fox Associates allowed him to participate on a project team for virtually untaught in most architecture schools.

Despite the fact that his classmates will have graduated in the year he was gone, Kaufman has no regrets. “The job has removed some of the anxiety of the unknown and given me a better feel for what to expect when I get out.”

You would think that a person with eight years of job experience would have little to gain from cooperative education. But doctoral student Susan Mings found a whole new set of career possibilities after her work with Key Services in Albany.

Mings’ position as multimedia instructional designer added a new dimension to the work she had done as a technical writer, a programmer, or a systems analyst. The job demanded high proficiency in design, communication, and technical knowledge. “Just the skill set of a person who comes out of my department [rhetoric and communication],” Mings says.

“We developed multimedia programs to train current Key Services employees to use the new banking applications software that would be installed in Key Bank branches the following summer,” she explains.

By the time you put something on the screen, you had talked to the users, the tellers, bank officers, and data processing operators who would actually be working with the application to determine their needs.

“I gained exposure to a new field, a different authoring tool, the development of a good design methodology, and was able to participate in an ongoing, real-world industrial experience. Added to which, I was able to make money. It’s like icing on the cake,” says Mings.

**Second Generation Co-op**

Denis Lussier ’88 is handing down co-op experience to a second generation at Rensselaer. A co-op student once himself, today he owns a computer consulting business with clients from Princeton, N.J., to Valhalla, N.Y.

Lussier found co-op experience to be a great differentiator during job interviews. “It also gave me experience with a large company, and helped me define what I was looking for,” he adds.

Now Lussier’s company, Fusion Technologies Inc., and Datalogix International have teamed up for a novel co-op situation. “I am recruiting students who will work for my small consulting company and are placed for assignment in Datalogix, a mid-sized company. This allows the co-op students to see what both worlds have to offer. And it gives both companies the opportunity to evaluate them for potential full-time employment.”

Lussier finds that co-op students are a plus in his business. “With technology changing so rapidly, anybody you hire needs to be trained. Co-op gives you a chance to hire somebody at a reasonable rate, while you’re evaluating them for potential full-time employment.”

“We are looking for intelligent, hard-working young people who are willing and eager to learn. And co-op students fit the bill,” Lussier adds.

As Diana Leis Delker looks back through the years, she is most amazed by “the change you see in students before and after work tours—the maturity, the personal development. It is truly a process of becoming,” she adds.

Delker has seen students slouch into her office, projecting defeat.

“One graduating senior came to me in April,” recalls Delker. He’d had no

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*“The job has removed some of the anxiety of the unknown and given me a better feel for what to expect when I get out.” —Brian Kaufman*
job offers. He felt that what had hurt him most on interviews was that he didn’t have any in-depth knowledge of his career field. His biggest mistake was not having participated in co-op, he told Delker.

So he determined to chart a new course. He went on to graduate school—actually postponing his graduate studies—and entered co-op his first semester. He entered the work force with new resolve and confidence in his abilities, says Delker.

“We’ve had a number of students start their own businesses and work it as a co-op,” she says. “It’s exciting to watch these people explore whether or not they’ve got what it takes to make a business grow. A case in point was the incubator for co-op status set up by the principals of what is now known as MapInfo.”

“Co-op opens up doors and exposes students to many different opportunities. For some students it’s the motivation to go to graduate school. A few may find the perfect niche and want to work for that employer. Others may have had an experience that tells them that this is not exactly what they’re looking for, and they move on to other career opportunities.”

Of all the images and the thousands of success stories, Delker is reluctant to single out one. Each student is indelibly etched in her mind.

“What stands out for me is the biomedical engineering student who worked on a research project designing prosthetic devices who knew he’d found his life’s work. Or the electrical engineering student who couldn’t believe his ears when he found out he was able to get a patent for his contributions to a project. Or the physics student who had lost his self-confidence. He got an outstanding rating for his work and came to believe in his self-worth.”

And what stands out for the students is the co-op office and its staff. “Co-op is an incredible resource,” says Susan Mings. “I’ve been to four universities and I haven’t seen this level of helpfulness and the resources for finding co-ops anywhere else.”
Disposing of a Cold War Legacy

A post-Cold War nuclear thriller, starring Paul Shaffer '79

by William Hershey

Excerpted and reprinted with permission from the Akron Beacon Journal
Tom and Mary Shaffer were preparing to leave Akron on the day before Thanksgiving [1994] when the phone rang. It was their son, Paul, whom they were getting ready to visit at his home in Washington, D.C.'s northern Virginia suburbs.

Paul urged them to delay their departure a bit.

"Why don't you wait?" asked Paul.

"Turn on CNN news."

When the Shaffers did, they heard about "Operation Sapphire," a post-Cold War nuclear disarmament thriller, with Paul in a starring role.

Paul Shaffer, a 37-year-old Navy commander, and 30 other Americans had secretly transferred 1,300 pounds of weapons-grade uranium from the huge, barren and by-then-frozen former Soviet Republic of Kazakhstan to a Department of Energy storage site in Oak Ridge, Tenn.

That's enough enriched uranium to start a small nuclear arsenal.

When the Americans and the uranium were safely packed aboard three Air Force C-5s, no chances were taken. The 20-hour non-stop return flight—with several in-air refuelings—set a record for the C-5.

"We have put this bomb-grade nuclear material out of the reach of potential black marketers, terrorists or new nuclear regimes," Defense Secretary William Perry told Shaffer's mother and father and everyone else who was tuned in to CNN.

It had been a stressful and tedious job.

Shaffer and the other team members "spent six weeks doing six months worth of work," said Energy Secretary Hazel O'Leary.

But making the world a little safer wasn't the only thing the Operation Sapphire team did in Kazakhstan.

In their spare time, they raised $2,000 to buy toys, clothes and blankets for two Kazakh orphanages, and they provided the orphans and a church with 50 large boxes full of donated toys, stuffed animals and clothing. The Defense Department

he was a little older—maybe 13 or 14.

While Shaffer admits that he had a sip or two of that wine, it was the chemistry that fascinated him.

During Shaffer's senior year, his parents were surprised to learn that he had been awarded an appointment to the Air Force Academy in Colorado Springs, Colo. They were even more surprised when he turned it down.

Shaffer said no to the Air Force because he had decided to join the Navy and drive submarines.

"The thing that sticks in my mind, I was doing some work at home (and) I was watching a movie on TV," he recalls. "It was John Wayne or somebody, a World War II submarine movie, and all of a sudden this light came on someplace—that's your calling."

He got a Navy ROTC scholarship to study at Rensselaer Polytechnic Institute. He graduated with a bachelor's degree in nuclear engineering in 1979 and began his Navy career.

Most of it, nine of 15 years, has been aboard submarines.

But Shaffer, of course, was not driving submarines in Kazakhstan, a giant chunk of central Asia about four times the size of Texas.

He was on shore duty then—something every sailor must tolerate from time to time.

When Shaffer's most recent turn came in 1993, he joined the On-Site Inspection Agency. That agency was established in 1988 by the Defense Department to carry out the inspection and monitoring requirements of U.S. international arms-control treaties.

Since these treaties regulate nuclear weapons, the job was a perfect fit for someone with Shaffer's background.

By last August, Shaffer's On-Site Inspection Agency assignment had taken him to the American embassy in the Kazakh capital of Almaty.
Kazakhstan is one of the republics of the former Soviet Union where strategic nuclear weapons had been located.

"It was a pure case of being at the right place at the right time," Shaffer says.

Earlier in 1994, the newly independent Kazakh government secretly had asked the United States to take its enriched uranium—the unwanted legacy of the nuclear arms race—off its hands. Protecting the uranium was a drain on a nation trying to make the transition from state control to free-market economy.

Besides, Kazakh President Nursultan Nazarbayev had ratified the nuclear Non-Proliferation Treaty and promised to make his country nuclear-free.

The nuclear material was stored at the Ulba Metallurgical Plant, situated on wind-swept steppes 20 miles outside the city of Ust-Kamenogorsk. The material had been made in Russia and sent to the plant in the 1970s for use as fuel in naval vessels, although it also was suitable for weapons.

Moscow's approval was necessary for the first-of-its-kind transfer. That came in June.

In August, a site survey team working on the top-secret Operation Sapphire came through Kazakhstan.

When American Ambassador William Courtney found out that Shaffer was a nuclear engineer, the ambassador chose him to accompany the team on a trip to look over the Ulba Metallurgical Plant.

Then the site survey team—with Shaffer now on board—returned to the United States and planning began for the transfer.

The 31-member Operation Sapphire team of 29 men and two women included 25 scientists and technicians, a doctor, a communications expert and four Navy men—Shaffer and three Russian-speaking interpreters. Of the non-Navy members of the team, most came from Martin Marietta Energy Systems, the company that runs the Oak Ridge storage site for the Energy Department.

Ambassador Courtney expected Shaffer to serve as a liaison between the site team and the embassy. The On-Site Inspection Agency wanted him to direct the interpreters and provide support for the whole team.

On Oct. 7 President Clinton gave the final go-ahead and at 2 a.m. on Oct. 9 the Operation Sapphire team was in the air.

"We got there about 4:30 in the afternoon on the 10th of October," Shaffer recalls.

The work began—six days a week, up to 14 hours a day.

Of the 17,000 employees at the plant, only about a dozen worked with the Americans.

Nobody else was supposed to know what they were doing. If questions arose, the Americans were to say they were from the International Atomic Energy Agency and had been invited by the Kazakh government to inventory nuclear material.

Shaffer says many countries around the world are seeking such highly enriched uranium and there was no desire to draw attention to its availability.

"The issue was," Shaffer explains, "if somebody perhaps got wind of what we were doing and knew there was going to be a bunch of highly enriched uranium, which you can usually take and fabricate nuclear weapons from, that it's going to be transported, and put on a U.S. airplane..."
and flown halfway around the world—well, the potential just exists for some regime who would like to get ahold of that to try to intercept it."

It took a while for the Americans and the plant employees to get to know each other.

"The people we dealt with—initially there was some trepidation...it's dealing with people you don't know," Shaffer says. "There's initially a low level of trust."

The Americans set up shop in a 20-foot-by-40-foot unheated World War II-vintage brick vault. They brought in their own electrical power supply, satellite communications equipment and forklift trucks. The temperature outside seldom was above freezing.

They removed the uranium from 1,050 nuclear containers and put it inside 1,400 quart-sized steel cans. The quart cans then were transferred to 55-gallon drums.

Some of the uranium was in pure metallic form, some was in an oxidized powder, and some already had been turned into fuel rods for nuclear-powered naval vessels. The Americans made the switch using three "glove boxes," long plastic tubes with plastic gloves that reached into the old storage containers. The glove boxes allowed the scientists to safely process the uranium and put it into the new containers.

Shaffer wore several hats.

He coordinated the work of the translators, who helped the American scientists and the workers at the plant understand each other.

"They (Shaffer and the other Navy men) helped us negotiate some pretty tough technical issues," says Alex Reidy, leader of the scientific team. "As you can imagine, each country has its own rules for how these materials are handled. Safety standards in one country are not the same in another."

Shaffer also helped Reidy inventory the uranium—not a particularly easy task since the records at the plant were in handwritten ledgers.

"We had to double-check their inventory," Shaffer says, explaining that the Americans didn't want to leave a pound or two of uranium behind, unaccounted for.

Shaffer had other roles on the mission, too. He was in charge of exchanging American money for local currency, and he put out five editions of the "Üst-Kam Gazette," a combination of news bits from the outside world and humor.

The Americans were allowed to make one phone call a week, but it was mostly "Hi" and "How are you?" to the family back home—nothing about exactly where they were or what they were doing.

And gradually workers at the plant warmed to the Americans. The Americans had come bearing gifts—tools, flashlights and pen knives—gifts that would have cost the plant workers a couple months' wages.

"Near the end it was like a big family," Shaffer says. "(They, workers at the plant) were bringing in food that they had canned, homemade jams, pickles, bread. We were bringing in fruit."

The Americans made tea, coffee, and hot chocolate on their hot plate and shared it with the plant workers assisting them. For lunch, they heated up military "Meals Ready to Eat"—MREs.

It was Petty Officer 2nd Class James Fite who came up with the idea of helping some of the most needy residents, the young residents of two orphanages.

Fite's parents back in Pennsylvania had collected clothing from their church. Shaffer helped Fite arrange the donation. This included persuading the Pentagon to ship the toys and clothing to Kazakhstan on the planes that were being sent to pick the Americans up.

Then other Americans got in touch with their friends and relatives back home and arranged for even more donations.

And they collected $2,000 among themselves to buy coats, gloves, hats and baby formula for the children.

Shaffer, Fite and two other Americans took the toys, clothing and bedding to the orphanages. "At each orphanage we personally handed out some stuffed animals and toys to groups of kids," Shaffer says.

One orphan, 2-year-old Bakhyt, picked Shaffer out and jumped onto his lap.

"She wouldn't let the other kids come near," he says.

Now he and his wife, Amy, who have no children of their own, want to adopt Bakhyt and bring her home to live with them in suburban northern Virginia.

"We're trying to pursue it," he says. "It's going to take a long time."
Developing Tomorrow's Leader
Corporate-sponsored conference provides training for students

Alumni can support Rensselaer not only by making personal gifts but also by influencing their employers to give time and money.

Barry Ilberman '72, vice president of corporate and environmental affairs at Northeast Utilities in Hartford, and Keith Lawrence '78, associate director of human resources at Procter & Gamble, convinced their corporations to sponsor this year's Student Leadership Conference on Sept. 23. Sponsored by Rensselaer's Mary Jane and Al Neidon Leadership Dinner, the conference offers some 250 students and workshops to develop leadership skills. This year's theme is "World-Class Leadership: Building Global Champions."

Besides providing corporate financial support, Lawrence and Ilberman have enlisted the help of several corporate managers to act as workshop leaders.

Ilberman, who recalled only "ad hoc" leadership training when he was a student, says that his company's commitment reflects its belief that technology-based companies need strong leaders in the professions.

"When I was a student, strong technical skills may have been enough, but today's students must relate knowledge to worldly concerns, work in teams, and communicate well," Ilberman says.

Martin Marietta sponsored last year's conference. John Freeh '80, president of the Knolls Atomic Power Laboratory, which Martin Marietta runs, was keynote speaker.

Alumni executives also participate in other Archer Center programs. David Halwig '72, a principal in KPMG Peat Marwick, Diane Harris '67, vice president of corporate development at Bausch & Lomb, and Robert Grimmett '60, vice president of Teviron, have participated in exercises in a School of Management leadership class. Harris also spoke at the center's "Celebration of Leadership" dinner in April.

Annual Fund Provides a Direct Line to Students

Every gift of expendable dollars to the Rensselaer Annual Fund brings direct benefit to students and to academic programs.

"It's important that alumni who give Rensselaer expendable dollars each year understand that their generosity means that good things happen for students," says Tony Gaetano '66 of Madison, Conn., who is National Rensselaer Annual Fund Chair.

Rensselaer raises about $3.6 million a year in unrestricted gifts—much of which supports scholarships for worthy students. Rensselaer provides more than five times that amount in financial aid each year to students. All of that support must come from unrestricted dollars.

Unrestricted gifts also support Rensselaer's core academic mission, an effect that is amplified by Rensselaer's ongoing efforts to streamline administrative costs. The percentage of revenues invested in aid and academic programs has increased over the last 10 years. During that same period, Rensselaer successfully shrank administrative expenses, as a percentage of total instructional expenditures, from nearly 40 percent to below 20 percent.

Moreover, expendable gifts help right now. An annual expendable gift of $5,000, applied to scholarship, has the same impact in one year as a $100,000 endowed scholarship—since endowments generally generate an annual spendable return of approximately 5 percent.

"You're in effect achieving a leveraging effect of 20 to one compared to an endowment," says Paul Lawler, Rensselaer's vice president for finance.
Reunion '95 broke attendance records and brought a pervasive touch of Paris to the Rensselaer campus June 8-11.

More than 1,200 people attended, including 700 alumni with their guests and families, to mark reunion milestones. Alumni from as far away as Hawaii, South America, and Turkey came back to campus.

"Reunion '95 was the best ever," says Lori Chen '75. "It was our first opportunity to sit and chat with people some of us hadn't seen in 20 years."

At the Parade of Classes, which led all reunion participants to the Class Picnic, each reunion class displayed pride and spirit (and offered enterprising bribes to the parade judges) with imaginative floats and placards.

The Class of '75 carried a giant slide rule, the Class of '70 wore colorful tie-dyed T-shirts, and the Class of '50 transformed campus into a Parisian scene. With red berets, black moustaches, and a rolling replica of the Eiffel Tower, the class paid tribute to Paris, where many had spent time during World War II.

Special berets were imprinted for the Four Horsemen, a singing quartet recreated from their college days that has only improved with age. Jim Moore '50, Bob Wassung '50, Chuck Kelly '50, and Bob Webster '52 serenaded the parade judges, the Friday night cabaret audience, and basically, anyone who asked, with sparkle and talent.
All alumni were invited to attend Alumni College for a Day, campus tours, department open houses, a field day sponsored by the Class of ’70, and the Physics Magic Show, among many other activities. Student hosts helped each class feel welcome and young again.

“The June reunion was a smashing success and those of you who were not able to attend missed a great time,” says Jim Moore ’50.

Troy’s Junior Museum provided “live” entertainment in the children’s tent.

The 50 Year club gathered to lead the Parade of Classes.

Unique hats helped the Class of ’45 celebrate its 50th reunion.

The Class of ’55 overwhelmed its winning parade float, a fire truck.

President R. Byron Pipes and his wife, Ruth Ellen, greeted alumni at the Class Picnic.

Paris descended on the Rensselaer campus, thanks to the Class of ’50.

Friends and families renewed acquaintances in the picnic tent.

Classic tie-dyed T-shirts earned the Class of ’70 parade honors for best appearance.
The Rensselaer Alumni Association gathered for its Ninth Annual Awards Dinner on campus June 9 to honor its 1995 award recipients.

President R. Byron Pipes presented the association's highest honor, the Distinguished Service Award, to Warren Bruggeman '46. "It is my distinct pleasure to honor an outstanding supporter of Rensselaer," said Pipes. "You have dedicated your life to distinguished service."

Bruggeman was cited for his volunteerism—he is a trustee on a number of boards, including Rensselaer's; his entrepreneurial spirit—after a successful career as a pioneer of nuclear power with GE, he has become an adviser to young companies; and his support of the international community—together with his wife, Pauline Urban Bruggeman, he has developed business incubators in the Ukraine.

"I deeply appreciate the honor," said Bruggeman. "It is recognition not only to me, but an award I share with Pauline."

Also at the awards ceremony, the RAA presented Albert Fox Demers Medals to Max Bleck '50, Richard Bouchard '58, Anthony Gaetano '66, and Archibald Love III '42 in recognition of their outstanding efforts on behalf of the alumni body.

The Alumni Key award honors outstanding service to Rensselaer, particularly to alumni clubs and classes. Keys were awarded to Raymond Ash '60, James Fitzgerald '60, Michael Jhin '71, Richard Lassen '50, Robert Lyons '50, Simone Peterson '84, Michael Marvin, Steve Soucar '79, and Raymond Weisner '75.

The Office of Alumni Relations presented Director's Awards, recognizing significant contributions to the success of the RAA, to Herbert Asbury '45, Stuart Berg '67, Charles Rancourt '70, Anna Ruepp '95, and Paul Witbeck '43. Each received a director's chair.

The RAA presented its second annual Teaching Award to Jorge Haddock '79, associate professor of decision sciences and engineering systems.

Representatives of regional alumni clubs accepted the following annual awards: the Rensselaer Club of Boston received the Craig W. Angell '35 Club of the Year Award; the Rensselaer Club of Rochester received the Chuck Monis '50 Most Improved Club of the Year Award; and the Rensselaer Club of Orange County, Calif., received a Special Recognition Award for outstanding work in admissions. The Rensselaer Phonathon Cup Award was presented to the Rensselaer Club of Greater Hartford, which raised more than $100,000.
Class Notes Deleted for Privacy Concerns
Make the Difference

It was an exciting summer for Alumni Relations. The dust had barely settled on a successful Reunion '95 when the announcement came. At the July 10 Annual National Assembly of the Council for the Advancement and Support of Education (CASE), Rensselaer's Office of Alumni Relations was recognized by its peer institutions with the highest award CASE bestows upon alumni programs: the Grand Gold Medal for Excellence in Overall Alumni Programming.

Sponsored by the Ford Motor Company Fund, the award and $2,500 prize will be shared by Rensselaer and Concordia University in Montreal. Judging was based upon programs and services in the following areas: linkage with faculty; linkage with students; and linkage with alumni.

While staff members are extremely proud of this accomplishment, Peg Aldrich, director of alumni relations, says, “The success of every one of our programs is rooted in the tremendous support, enthusiasm, and hard work of hundreds of dedicated alumni volunteers. We are grateful that this honor was possible because of their contributions to the alumni program at Rensselaer.”

Below are excerpts from the Rensselaer Alumni Association's 1995 Annual Report. Listed are just a few of the quality programs made possible by alumni volunteers. Congratulations to each one of you for the success of your association and the programs of the Institute!

Rensselaer's Alumni Relations staff is: Peg Aldrich, director; Valerie Beck, administrative secretary; Susan Dibon, associate director; Anne Ferraro '89, assistant director; Helena Fox, assistant director; Ellen Johnston, administrative secretary; Joyce Kelly Martin, coordinator; Lisa McGrath '89, senior assistant director; Peter Pedone, assistant director.

Alumni Traditions

Total Reunion '95 participants numbered over 10 percent more than last year.

More than 55 programs were brought to 20 regions nationally, representing 57 percent of regional alumni chapters. Event attendance increased over 30 percent.

Athletic programs included a satellite broadcast to 40 locations worldwide with more than 900 viewers; Big Red Freakout Alumni Ice House (pre-game buffet dinner and pep rally) attended by over 350 guests; and receptions following post-season play that drew 1,000 guests.

Rensselaer Medal Receptions hosted by regional chapters and alumni around the country have consistently drawn in excess of 1,000 participants over the last five years.

Linkages

An Institute-wide program has been established to enhance the Rensselaer alumni volunteer experience. It will focus on activities that identify, communicate with, inform, and recognize volunteers at Rensselaer.

The RAA Student Chapter—Student/Alumni Mentoring Program links students with upperclass or alumni mentors. The program matched 50 students this year.

Alumni College for a Day and the Technology Fair are Reunion programs featuring interactive sessions with faculty members on what is current in their field. The programs drew more than 350 of the 1,200 guests at Reunion 1995.


To Learn More

If you'd like a copy of the RAA's 1995 Annual Report or you'd like to find out more about joining the RAA Board, contact Peg Aldrich, director of alumni relations, at (518) 276-6062 or e-mail aldrin@rpi.edu.
"I'm a tough sell. But I know a good deal when I see one."

Joe Nicolla '79, a partner in Columbia Development Corporation, knows a wise investment® when he sees one. He knows that each dollar given to the Rensselaer Annual Fund goes directly for student support in the form of scholarships, curriculum development, student life activities, and improvements to the student learning environment. "I know my gift to the Rensselaer Annual Fund goes to the heart of the institution, where it's needed most—for students. And I know that every dollar counts."

Make a difference® in a student's life today. Give to the 1995-96 Rensselaer Annual Fund.

If you'd like to know more about the Rensselaer Annual Fund, call Terri Van Patten, director, at (518) 276-8568 or vanpat@rpi.edu.

THE RENSSELAER ANNUAL FUND
Celebrating Tradition Today

High above the Rensselaer Union, Rensselaer's flag celebrates our history and heralds our future.

At Rensselaer we stand on the shoulders of giants such as Stephen Van Rensselaer and Amos Eaton. Their visionary work firmly established our place in history and created a proud tradition worthy of our highest regard.

Rensselaer's flag, created in 1994, reflects our past. The four quadrants of the flag are found in the coat of arms of Kiliaen Van Rensselaer, great-great-grandfather of the Institute's founder. These symbols graced the first official emblem of Rensselaer created in 1904 and are elements in the university seal. The colors are true to the hues of a 1656 stained glass window depicting the coat of arms.

But the flag is also in tune with the future, with the present-day Institute logotype at its center.

Flying alongside the American flag and the flag of New York state, Rensselaer's flag honors generations of alumni and salutes tomorrow's graduates—the dreamers who will create the 21st century.