

WPI Journal

WORCESTER POLYTECHNIC INSTITUTE

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FEBRUARY 1984

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WPI's Foreign Students
COOP—The Eight-Month Energizer



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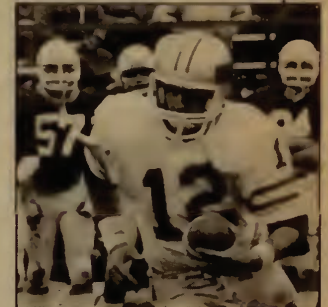
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A Gift of Magnificent Proportions: The Walter and Miriam Rutman Scholarship

WPI's largest-ever donation for scholarships comes from a Depression-era alumnus who everyone thought had forgotten his alma mater.

By Michael Shanley

The letters are 50 years old now, and the pages have yellowed with age, but the words have lost none of their urgency.

The story told is of a young man anxiously searching for work in a dismal job market. His correspondence is with a job placement contact at his alma mater. The year is 1934.

(March 1) *Contact*: There is a possible opening. . . . I have written to suggest your name. . . . If you are interested, write or phone Mr. Merrill immediately."

(March 6) *Young Man*: On receiving your letter, I immediately telephoned

Mr. Merrill only to learn that the position had been filled. Your lead, although it proved disappointing, was encouraging.

(Sept. 6) *Young Man*: I still need a job; and necessity will soon place me in an awkward spot. I have managed an irking sustenance by sundry odd jobs. . . . How do things appear?

(Sept. 11) *Contact*: We haven't had wind of anything during July and August. But I am confident there will be need for more men this fall.

(Nov. 4) *Young Man*: Thank you for your letter of recommendation, but the firm was unable to raise the necessary funds and the high enthusiasm dwindled quickly. . . . I need a job badly. . . .

The young man did get a job. He worked hard. He prospered. His alma mater heard little from him over the years, but the young man had not forgotten.

His name was Walter Rutman, Class of 1930. He died last year at the age of 74. In his will, he left WPI \$1.5 million. The money, he specified, is to be used "for scholarships for needy students."

Rutman owned the *Rhode Island Herald* newspaper, and he was owner and president of the Herald Press and the Ondine Publishing Company, both in Rhode Island. He was the former owner of the *East Providence Post* and the *Seekonk*

(Mass.) *Star*, both weekly newspapers.

Rutman's wife of 45 years, Miriam, says her husband never kept in touch with anyone at WPI because "That's the way he was, a very private man." But he did remember the school fondly. "He always felt he got an especially good education there."

By earmarking the money for scholarships, Rutman may have been trying to lighten for others the burden he himself shouldered at WPI. He put himself through school, in part by working as a correspondent for the Worcester *Evening Gazette*. This introduction to journalism would later serve him well.

Upon his graduation in 1930, the young chemist found a job with Chase Copper and Brass Company in Waterbury, Conn. When the economy failed to rebound during the early years of the Great Depression, the company was forced to lay off workers, and Rutman, still single then, was without a steady job. "They only kept the men who had families to support," says Mrs. Rutman, who married Walter in 1938.

Rutman soon moved to Providence, where he had relatives, and persevered through a series of odd jobs. Then, in 1935, his fortune began to change. He and a partner bought the struggling *Jewish Herald* newspaper.

In those early days at the *Herald*, Rutman was troubled by a nagging problem: he couldn't find a printer whose standards of quality and speed met his own. Says Arthur Lemoi, who worked with Rutman for nearly 25 years and now runs the business for Mrs. Rutman, "He didn't want to print his paper when somebody else was ready. Finally he just decided to do it himself." Thus was born the *Herald Press*.

It was at this point that Rutman, who by now had bought out his partner and was sole owner of the *Jewish Herald*, took what others saw as a foolish gamble: his printing company was among the first to adopt the new offset printing process, a controversial alternative to the traditional letterpress procedure. There were those who predicted disaster. Now, of course, offset is the industry standard.

In later years, he brought in the web press, phototypesetters and OCRs (optical character readers). "We were using the computer in the mid-'60s—long before most publishers," says Lemoi.

In the 1960s, Rutman formed the Ondine Publishing Company for retail publishing accounts. He also bought the



Walter Rutman, Class of 1930. Opposite: Mrs. Miriam Rutman and Kathy Kruczek, '84 ME, of the Student Alumni Society, at a ceremony announcing the fund.

East Providence Post and started the *Seekonk Star*. "At one time or another, the company printed almost every community newspaper in Rhode Island and southeastern Massachusetts," says David Howard, who worked as an editor for Rutman and now publishes the *Post* and the *Star*.

Of Rutman's editorial stance, Howard says, "He looked at the community newspaper as a source of hometown news with as much emphasis on the person who was promoted in his or her job, as on what was happening with the zoning board." His papers earned a reputation for fairness and accuracy of reporting as well as for excellent printing.

Rutman's passion was his work—seven days a week. "He was tough, but he was a straight shooter," says Lemoi.

Rutman's drive and determination carried through all he did, business or pleasure. Tony Caranci, golf course superintendent at Ledgemont Country Club, got to know him well, because Rutman was Ledgemont's greens committee chairman for many years.

"I'd see him out on the course almost every morning," remembers Caranci. "And I mean early—six o'clock or before—just him and my sprinklers."

Later, nearing 70, Rutman found a new interest—canoeing. As usual, he went all out.

"One night I got this call from a total stranger," recalls Manny Point, founder and past president of the Rhode Island

Canoeing Association. "He said he was going on a canoe trip to the Allegash Wilderness Waterway in Maine, and he wanted to learn everything about the sport." Point agreed to give the stranger a few tips.

"When I saw this thin older man walk up, I began to wonder what I had gotten myself into. But he was stronger than he looked and he worked very hard. He came back from that first Maine trip happy as a baby. What he remembered most about WPI was the professors he had. He spoke highly of them."

Rutman's education never really ended. The Rutmans were active members of the Providence Athenaeum, one of the oldest private libraries in the country. The Athenaeum staff remember him as a very quiet man. And, quietly, he left the Athenaeum \$50,000, the largest gift the library has ever received.

"His devotion to the Athenaeum surprised even me," says Mrs. Rutman, who is still a regular there. Nor was she aware of the great extent to which he had helped Trinity Square Repertory Company, Providence's theatre group.

Marion Simon, assistant to Trinity director Adrian Hall, calls Rutman "... the greatest benefactor we had. He printed all our programs and never asked for the money we owed. He had a deep sense of what was right and wrong."

It was this sense, one can surmise, that moved this quiet, intensely private man to provide generations of students with an opportunity they might otherwise be denied. Scholarships for needy students are important, Walter Rutman might say. They are "right."

At the public announcement of the Rutmans' magnificent gift, held at WPI on October 12 and attended by Mrs. Rutman and some 200 students, faculty and friends of the college, President Edmund T. Cranch declared, "This gift, establishing the Walter and Miriam Rutman Scholarship Fund, will enable WPI to lighten the financial burden many of our students are forced to bear."

Said Robert F. Reeves, Vice President for Student Affairs, "The nation can ill afford to have qualified students miss getting the highest quality scientific and technological education because of insufficient resources. Similarly, WPI cannot let the quality of our student population be determined by their ability to pay."

"The Rutmans," added Dr. Cranch, "recognized that education is the common currency of democracy."



It's My World and It's Yours, Too.

Students from nearly 50 countries bring to WPI a rich tapestry of backgrounds. But for some, the road home may be treacherous.

By Michael Shanley

Kiet remembers the guards' submachine guns reflecting in the moonlight as he and hundreds of others boarded the rusted fishing boat that night.

He was too young then to be properly terrified, too young to realize how many "boat people" never saw land again. He was unaware how many fell victim to foul weather, unsafe boats and marauding pirates.

Kiet's father had been trying to get the family out of Vietnam for four years—ever since the communists took Saigon in 1975.

The boat trip was a final act of despera-

tion, a long and arduous journey undertaken only as a last resort. Efforts at securing forged papers that would have allowed the family to leave by air had failed. So had the other alternatives Kiet's father had explored. He had dealt with a number of seedy characters peddling empty promises. Most had simply stolen his money and fled into the Saigon underworld.

If other possibilities for escape even existed, there was, suddenly, precious little time. The family was being followed by the secret police—had been, they were chilled to learn, for more than a year.

It was time for drastic action: it was time to secure a boat.

A group of friends banded together and

purchased the iron-hulled fishing boat that would take them to Hong Kong. The proper officials were bribed, the plans were made. Papers were forged so that relatives, and not the government, would get their house and belongings.

Now the Hoangs—Kiet, his parents, two brothers and a sister—were set to leave their troubled homeland. For Kiet, that homeland represented a jumbled mixture of memories. There were the good times: the family gatherings, the childhood friends, the sheer excitement of growing up. But there were also horrors like the Tet offensive of 1968, with bombs dropping across the river and hills of human bodies piling up on the roadside.



At WPI (from left): Lisa Lee, '87, New York City, formerly from Hong Kong; Carlos Gutierrez, '87, Guaynabo, Puerto Rico; Luis Quijano, '86, Panama City, Panama.

All in all, Kiet was glad to be leaving, glad because it meant not having to anxiously await the arrival of his father each evening. The entire family had come to live vicariously through Mr. Hoang, waiting to see the expression on his face when he came through the door at the end of the day. A smile meant he had a lead on some means of escape; it meant hope. If there was no smile, well, things had gone poorly, another plan had fallen through, another hope had been dashed.

More than 400 people were crammed into the boat that night as it slipped without incident off into the moonlight. For nine days they huddled together, eating only rice. Twice they bypassed Hong Kong by mistake. They spent an entire day hopelessly lost somewhere off the coast of mainland China. Another day, the boat was nearly destroyed in a ferocious storm.

But in the end, the Hoang family were survivors. They finally landed on the shores of Hong Kong, where they lived with relatives for five months. Eventually, they came to the United States and now live on Cape Cod.

Kiet is a sophomore computer science major at WPI. If his past differs greatly from that of most students, then he

serves as an excellent illustration of the one overriding tie that binds the WPI foreign student population: they bring to the campus a richly textured background often unfamiliar to American students.

About 280 foreign students from 46 countries are currently enrolled at WPI—about 7.3 percent of the full-time population. Of these, about 125 are graduate students. More facts:

As might be expected, figures nationally vary greatly. According to the Institute of International Education, foreign students represented 2.7 percent of the total U.S. higher education enrollment for the 1982–83 school year.

Miami-Dade Community College headed all others with 4,186 foreign students enrolled. The University of Southern California and University of Texas at Austin were next in line. Northrup University, in Inglewood, California, claimed the largest percentage of foreign students—70.5 percent, followed by Southeastern University, in Washington, D.C., where 64.9 percent of the students are foreign.

Massachusetts, with more than 16,000 foreign students, was ranked fifth in the country in total number enrolled, behind California, New York, Texas and Florida. MIT's foreign-student enrollment for

1982–83 was 20 percent of MIT's total enrollment, BU's was 7.8 percent and Harvard's was 12.5 percent.

Nearly a quarter of the national foreign student population studies engineering, making it the most popular field of study.

The largest single group of foreign students in the U.S. comes from Iran. Out of a total foreign student population of 336,985 in 1982–83, more than 25,000 were Iranian. That number, however, represents a 50 percent drop from the 1979–80 school year.

In the last decade, students from Iran made up a large block of the WPI foreign student population, but, following the national trend, their numbers have dipped sharply in recent years. The number of Iranians enrolled as full-time undergraduates at WPI plummeted from 49 in 1979–80 to 28 in 1982–83 to 12 in 1983–84. Moreover, there are no Iranian students in this year's freshman class.

It's not hard to see why. Iran has been in turmoil since the revolution of 1978, when the Shah was overthrown and the Ayatollah Khomeini seized power. In addition, the current war with Iraq has destroyed students' plans to study in the U.S.

Iranian students at WPI have felt the crunch. Many live in a troubling twilight of uneasiness that most American students can only imagine. For some, the phrase "you can't go home again" is chillingly real.

One student, who for obvious reasons chooses not to be identified, admits to having participated in the 1978 revolution. Now he regrets it.

"At the time, it seemed the right thing to do," he says. "So many of those in power—the wealthy—were corrupt. But now it's much worse."

He tells of letters from home always arriving opened, of phone calls being bugged. There is even concern that a government informant could be planted here at WPI. Despite the fact that his family is still in Iran, this student vows not to return while Khomeini is in power.

"There's no future for me there," he says. "My friends who stayed in Iran are now in the army or working at odd jobs. Their talents have been totally wasted. The universities there are a joke now. Everything is political."

He knows horror stories of imprison-

ment and harassment, torture and execution. "One letter—" he says, "if it goes to the right person—is enough to get someone hanged."

Dean of Students Bernard H. Brown, who is responsible for the undergraduate foreign student program at WPI, says that Iranian students who want to remain in the U.S. after graduation must enroll in a graduate program, apply for one year of practical training experience, or apply for political asylum.

"And if they do apply for asylum," says Brown, "then their family back home could be in danger because an application for asylum is considered a denunciation of the Ayatollah."

Fortunately, most foreign students don't face such troubling decisions. For many, cultural adjustments are the biggest hurdle. To offset potential problems of that kind, Dean Brown and his staff offer a special orientation program for foreign students enrolled in the freshman class. People like Dean John van Alstyne, Registrar Robert Long and oral communication specialist Kay Draper participate and explain programs informally to the students.

"Things we take for granted—speech, transportation and religious practices, for example—can be a real problem for some of these students," says Dean Brown.

One recently developed resource is the WPI *International Student Handbook*, completed in the summer of 1982 as an IQP by two undergraduate foreign students, Luis Anez and Jorge Castillo. Dean Brown's staff updates it annually and distributes it at the orientation. In addition to explaining the facilities at WPI, the handbook offers practical advice on everything from how to open a checking account to when to give someone a tip.

One major purpose of the orientation is to test a student's spoken English and to offer help if it's needed. That help often comes in the form of enrollment in one of Kay Draper's public speaking classes. Mrs. Draper uses WPI's audiovisual facilities to tape each student as he presents speeches during the course of a term.

"The difference between the first and the last taping is phenomenal," she says.

Students who have come in contact with Mrs. Draper speak glowingly of her, not just as a teacher, but as a person, a friend and a shoulder to cry on. Mrs. Draper, in turn, credits the entire WPI community with making foreign students welcome.

"Everyone," she says, "from the deans to the faculty and staff to the American students, has done a fantastic job. WPI is

known for its treatment of foreign students. People here care; they take the time. I've known of secretaries—who have God knows how many other things to do—struggling for 20 minutes to understand a foreign student's problem."

Mrs. Draper, whose dealings with Chinese students earned her a six-week teaching trip to China last fall, views treatment of foreign students as having repercussions far beyond WPI's boundaries.

"In a very real sense, world policy of tomorrow depends on what we do today. The students who come through our doors are tomorrow's leaders, and the first impression they get of this country is here."

Reviewing videotapes of speeches presented by students in Mrs. Draper's class illustrates another aspect of the foreign student population: many seem more alert to political and social realities than their American counterparts. Witness Mrs. Draper's students arguing global politics, the plight of the industrial worker and neglect of the elderly.

Lisa Lee, originally from Hong Kong and now a resident of New York City, speaks passionately about world hunger, about the fact that many Americans take for granted the kinds of meals that millions of children around the world never see. At the end of her speech she sings, in a strong voice and without a trace of self-consciousness, the words to one of her favorite songs: "It's my world and it's yours, too, and there's a lot we both can do if we try. . . ."

Carlos Gutierrez, from Puerto Rico, gives his talk on the United States and its involvement with Third World countries. He is an unabashed apologist for non-aggression. Luis Quijano, a Panamanian, knowingly discusses communism in Central America: how, for example, the peasants view the superpowers jockeying for position.

Contrast this with a recent poll taken by editorial writers at the *Worcester Telegram*. Students from five area colleges (Assumption, Clark, Holy Cross, WPI and Worcester State) were asked questions on history and current events. Results showed that only a third of the students could name the U.S. Senators from their state. Fewer than 30 percent could identify U.S. Secretary of State George Schultz. One senior at WPI, after placing the finish of World War II in 1952, was quoted as saying of wars, "They're nothing I ever bothered to pay attention to."

In addition to speech classes, Dean Brown's office makes a number of other services available to foreign students.

Far right: Oral communication specialist Kay Draper with Da Hai Ding, '83, WPI's first graduate from the People's Republic of China. Right: Dean of Students Bernard Brown.

World House, at the corner of West Street and Institute Road, was established in 1982 as a place where incoming foreign students could stay for a night or two upon their arrival in Worcester. "We didn't want them to be forced into a hotel on their first night in town," says Dean Brown.

The house has evolved into an all-purpose spot for meetings, lectures, parties and other activities. As one foreign student remarked, "You feel like a little grain of sand when you first get here, and World House helps you get through that."

Dean Brown's office also publishes a periodic newsletter, *World House Wire-less*, to keep international students abreast of new policies, programs and events. Sprinkled throughout the year are holiday parties, films of special interest and activities coordinated through the International Center of Worcester.

According to Dean Brown, one of his most important, and frustrating, duties as International Student Advisor is dealing with federal regulations. Last summer, the Reagan administration enacted tough new immigration policies designed to keep a closer watch on the nation's 350,000 foreign students. Most changes involve the filing of more paperwork, but, he says, the new regulations have presented WPI with few major problems.

With regard to national student immigration procedures in general, Dean Brown says a tightening was actually long overdue. "It had gotten to the point where the government had no idea who or where some of these students were."

Considering the sheer numbers involved—hundreds of foreign students versus a handful of WPI faculty and staff to deal with them—the foreign student program must be labeled a great success.

Still, it appears that a watershed of sorts has been reached. WPI may well be nearing its limit in terms of the number of students who can be effectively assimilated under the current arrangement.

Dean Brown admits that he doesn't have the time or resources to do all he'd like to for foreign students. Charles Heventhal of the Humanities Department, who coordinates the English as a Second Language program and thus deals with nearly all undergraduate foreign students, is also concerned about strain on the program.



"People are overtaxed, there's no question about it," he says. "But the important thing is that we have a good structure in place and we're building on that structure now. If we're going to get more foreign students, we've got to do it right."

Will there be greater numbers of foreign students at WPI in the future? A look to the past says yes.

Twenty years ago, during the 1963-64 school year, 48 out of 1,315 students were from foreign countries. That's 3.6 percent. A random check of statistics at five-year intervals since then shows a slight increase to 3.8 percent for the 1968-69 school year, followed by jumps to 5.6 percent in 1973-74 and 6.8 percent in 1977-78, culminating with this year's increase to 7.4 percent.

Nationally, however, growth in the numbers of foreign students has stalled. In the 1970s, each new year showed at least a 10 percent jump in foreign student enrollment. Figures from the Institute of International Education show just a 3.3 percent increase in 1982-83. A report issued by the Institute offers these reasons: "Services have suffered, financial aid has been reduced, and requirements for admission have become more difficult to meet." The worldwide economic recession of the early 1980s was also credited with having hurt the foreign student population.

But most of the policy changes that have negatively affected incoming foreign students—tougher admission policies, fewer tuition assistance programs and even some

tuition surcharges—apply primarily to public institutions, which enroll 65 percent of the foreign students.

At WPI and other private institutions like it, there is no financial assistance available to foreign students and, at least in theory, admission is based solely upon merit. If anything, places like WPI will be seeking more foreign students.

WPI Director of Admissions Roy Seaberg, '56 ME, says competition for top-flight foreign students will heat up in light of the dismal demographics facing colleges in the coming years. Seaberg this year instituted recruiting trips to South America and Europe.

"In purely practical terms," he says, "qualified foreign students are extremely attractive because they pay full tuition. But a certain balance must be kept. There's a point at which you have too many foreign students, and the Americans begin to feel uncomfortable."

WPI's current blend of foreign and U.S. students, he says, is well within the desired boundaries. "And we have students from all over the globe, not just from a handful of countries. They bring an international outlook to the campus and broaden the perspective of the undergraduates.

"Over the years, we've developed a reputation for accepting quality students from all over the world and treating them well when they arrive. Word about WPI gets back home."

By all indications, word does seem to

get back home and, in a couple of cases at least, WPI's reputation has survived more than a few changes of season. Mitsuo Kuwada, a student from Japan who graduated last year with a degree in chemical engineering, is the great-nephew and adopted son of Gompei Kuwada (Class of '93), the official keeper of the original WPI goat. And freshman Jia-He Mei, from Beijing, China, is the grandson of Yi Chi Mei, Class of '14, and the son of Tsu-Yen Mei, '49.

While these examples of tradition may be isolated, it is, in more general terms, a sense of past that makes international students such a valuable asset to WPI.

As a nation, America has a short history when compared with other countries of the world, many of which established themselves thousands of years ago. Students from these foreign lands bring with them a part of their homeland, a part of the past. For some, that past may be troubled, but it is no less valuable for that.

The same sense of past makes a foreign student's vision of the future equally enriching to the American who probes it. Consider Kiet Hoang. The terrible dreams he had about the secret police are behind him. Now he thinks only of the future. As for his career, he's not too interested in management or business. Rather, he plans to use his education to be inventive, to design "helpful things for society." He's also not particularly concerned with money, except for one thing—he does want to help his father.

“Everybody Gets into the Act” at WPI

Not since the 1954 season has WPI been undefeated and untied in football. But in 1983, as the season wound down, the Engineers got wound up, amassing 121 points in their last three games against a combined total of 22 for RPI, Hamilton and Fairleigh Dickinson.

Coming off four consecutive winning seasons, Coach Bob Weiss’s 1983 campaign broke the record books wide open: 225 points for the season against opponents’ 56; total offense of 3,182 yards—nearly 400 per game!

There were personal records, too. Auburn’s Mike Carbone, a junior, set a WPI scoring record with 78 points, and a single-season mark of 1,123 yards gained, breaking the old record by nearly 500 yards! He also racked up a game average of 140 yards. And senior Randy Mocadlo of Vernon, CT, set a single-game rushing record of 239 yards against RPI, scoring two touchdowns en route.



Michael Carroll

WPI Finishes Unbeaten and Untied

The scores: Coast Guard 35-14, Colby 30-7, Lowell 7-0, Fordham 22-6, Bates 10-7, RPI 28-8, Hamilton 42-0, Fairleigh Dickinson 51-14.

Probably the only disappointment of the year came not during the season, but on the day after the final game at Fairleigh Dickinson. Looking for its first-ever NCAA post-season tournament invitation, WPI was denied its bid by the selection committee, shattering the hopes of the entire college, yet failing to dampen completely the results of a sparkling season.

Other records:

- Only undefeated, untied college team in New England.
- Standings in NCAA Division III: First in New England, third in Northeast, ninth in the nation, and placed among the top three teams in rushing offense, rushing defense, and scoring defense.
- Team of the Year and Coach of the Year, in a vote by the New England Football Writers Association.
- Coach of the Year, Boston Gridiron Club.

A BRILLIAN



Michael Carroll



Michael Carroll



Michael Carroll

WPI Finishes with a Flourish

For the Fairleigh Dickinson game, some 400 fans—students, alumni, parents—made the trip to New Jersey, more than tripling the hometown rooters. FD seemed to know what was in store for them—a 51-14 blitzkrieg by the Engineers.

If you were part of the celebration afterwards, you know the thrill and the pride of victory. And you know the closeness of

this WPI team—perhaps the greatest ever.

As he boarded the bus for New Jersey with his players, bound for perhaps the biggest game of his life, Bob Weiss was confident. That confidence expressed itself in his feelings for the team, for when someone wished him success, he responded simply, "They'll do it. These guys'll do it. They're that kind of team."

IT SEASON!

THE EIGHT-MONTH ENERGIZER

Students are finding great value in getting away from the books for a while—and industry applauds their decision.

By Kenneth McDonnell

Rod MacLellan did it to confirm his career plans. Jeannine Machon wanted to coalesce the bits and pieces she'd learned in class. Diane Peterson put money away for college expenses. And Enis Konuk did it to get a taste of industry.

Whatever their reasons, a growing number of WPI students are opting for extra time in college in exchange for the kinds of experiences only outside employment can provide. It's all part of WPI's Cooperative Education Program (COOP), an eight-year-old arrangement that puts the expertise of undergraduates on the line every day, not in the classroom, but in plants and laboratories of industry and government.

According to Bruce VanAuken, Manager of Systems and Software Engineering at Dennison Manufacturing Corp., COOP benefits employers probably as much as it does students. "We get technically trained though normally inexperienced people

through COOP," he says. "They come to us knowing how to do fairly sophisticated work, but they simply haven't had much time to apply what they know. COOP brings all these loose ends together."

Dennison, of Framingham, MA, is a leading manufacturer of pressure-sensitive and metallic labels, thermal transfer products for industry, and other specialty goods. Junior computer science major Jeannine Machon of Randolph, MA, is Dennison's most recent COOP employee. She worked under VanAuken from June 1983 through January 1984, one of two eight-month COOP periods each year. "My programming assignment at Dennison," she says, "was concrete and market-oriented—just what I needed. Now I'm better able to see the practical possibilities of my course work and projects."

Student interest in COOP seems to be based on two, closely related objectives. "WPI is so intensive," says Joanne Shatkin, a junior biology and biotechnology major from Cranston, RI, "that many of us need a break at some point. But we

don't want to interrupt our education."

Equally important, say many COOP students, is their desire to get a close-up look at the profession they're studying to enter. For most, COOP is the answer to both concerns.

Joanne's COOP assignment in the Materials Protection and Biotechnical Group of the U.S. Army's Natick (MA) Laboratories fulfilled her personal and career needs. Natick Labs is the R&D branch of the Army that develops and tests the equipment used by the nation's foot soldiers—clothing, field shelter, freeze-dried foods and the like. As a member of a small research team, Joanne designed coatings to protect water purification units adaptable to various combat situations. "I'd gotten so caught up in my college work," she recalls, "that I never had a chance to ask myself what I was actually doing." Her COOP experience, she says, gave a sharper focus to her career plans.

Most COOP students find assignments in Massachusetts, but for those whose COOP experiences take them far beyond

Jeannine Machon, a computer science major, commuted to Framingham: "25 miles and 24 lights."



commuting range of Worcester, finding such necessities as housing becomes one more reminder of how true to life COOP is.

Senior Joan Marler, for example, a materials engineering major from Rochester, NH, was hired by General Electric to perform materials testing and manufacturing engineering at the company's Plainfield, CT, plant. For Joan, COOP was perhaps more full time than for most, since it meant relocating for her eight months away from WPI. But she found housing with an elderly woman not far from GE. "It was just fine," she says now. Socially, she spent time with her GE colleagues during the week; and on many weekends she made the trip back to her Worcester friends and classmates.

At first, she recalls, the pace at GE was slower than she'd expected, but after a short time on the job, more rigorous assignments came her way. "I was treated like a full-time employee," she says. "You learn quickly how to get things done in a corporate setting."

Joan had changed majors just before going on COOP. "My GE work and self-imposed departure from everything familiar gave me a confident sense of my career goals and the world beyond WPI," she says.

"Textbooks," Joan adds, "present the world in two-dimensional terms. But as we all know, the world is three-dimensional. COOP was the smartest decision of my college career."

Bonnie Blanchon, '83 CHE, who now lives in Acton, MA, made perhaps as much of her COOP venture as anyone can expect. Like roughly one-third of all COOP students, Bonnie participated in not one but two COOP periods, first at Procter & Gamble's Cincinnati, OH, plant and later at the Jaffrey, NH, manufacturing facility of Millipore Corp. At P&G,

Bonnie was in consumer research, testing products to support advertising claims. And at Millipore she developed synthetic membranes for use primarily by the medical profession.

Upon graduating, Bonnie found that, in job recruiting, COOP had been every bit as important as her degree. She was offered a job and is now working in the membrane engineering section of Millipore's Bedford, MA, facility. "This position ties my work to R&D," she says, "but I also interface with business, a fusion that suits me well." She also likes Millipore's industrial mission. "It rewards effort, it teaches you how to get along with people, and it lets you interact with the 'push' of manufacturing and the theory of R&D."

Bonnie was Millipore's first COOP student assigned to the Jaffrey plant. Says Thomas Lavin, Production Manager of Industrial Products at Jaffrey, "To Millipore—and many other companies, I imagine—COOP is a vital recruiting tool. We

can look at potential employees under actual work situations and pressures, and the students can do the same with us—with little down-side risk to anyone."

"WPI COOP students," adds David DeWitt, Millipore's Production Manager of Medical Devices, "seem to want positions where they can go in and 'get their hands dirty.' We're often in a fight-fire situation at Jaffrey, and we need to know how well a young individual can relate to our other 350 people and stand up under pressure from, for instance, an old codger who might say, 'Don't bother me, youngster!'"

In large measure, says Lavin, Millipore's endorsement of the COOP Program is a reflection of Program Director John R. Farley's knack for matching the needs of employers and students. "By visiting our facilities," says Lavin, "John gets to know what we do, how we work and what we expect from our employees."

Currently, says Farley, '68 CHE, some



Martin Hopkins, '83 CE, on the job at Morgan Construction.



John Farley, '68 CHE, directs the program: "95 percent of our COOP firms employ alumni."

60 students are on COOP assignments. More than 100 are signed up for the upcoming June-January period. Since taking over the program in 1979, he has seen the number of students registered nearly double. At this rate, he adds, the number could double again before 1990.

On the other side of the ledger, about 55 companies, nearly one-third of them outside of Massachusetts, are involved in the program. But, says Farley, corporate commitment is down considerably today, due to the recession of 1982. "With more and more students showing interest," he says, "we're always eager to speak with prospective COOP firms—especially in light of the program's benefits to employers." Alumni, he adds, are represented in about 95 percent of WPI's COOP companies.

According to Farley, 60 percent of COOP students are mechanical or electrical engineering majors, with the balance coming from computer science, chemical and civil engineering, and a few from the sciences.

Few requirements face students inter-

ested in COOP. They must be full-time juniors or seniors, maintain satisfactory academic progress and receive approval from their academic advisors. They pay no tuition during their COOP assignment and are compensated by their employers, but academic credit is not given for their efforts.

Like Bonnie Blanchon, Martin Hopkins, '83 CE, of Worcester, took full advantage of his two COOP assignments. Following his sophomore year, he went with Worcester's Riley Stoker Corp. as a programmer in its structural engineering department. He later worked part-time for Riley while back in school.

Today, Martin is assistant to the director of computer integrated manufacturing at Morgan Construction, Worcester, where he spent his second COOP. On assignment in Morgan's manufacturing engineering department, he was able, even as a COOP employee, to cross departmental lines and assume plenty of responsibility.

"That experience was *so* beneficial to my career," he now says. Not only did the

giant rolling mills manufacturer hire him ("Actually, my job offers outnumbered the rejections," he says), but he took on more meaningful duties right away than he had ever expected to.

"Whether or not you find a job with your COOP employer," he adds, "your résumé will undoubtedly be stronger for the experience."

One potential dilemma for COOP students is the stipulation that they prolong their academic career. One COOP period of employment means an extra two terms (14 weeks) at WPI to allow students time to complete course work, projects and the Competency Examination. Two COOP periods add a full year.

"It's definitely something to consider," says Joanne Shatkin. But, she contends, "too many students want to rush through college, get that sheepskin and jump into a job. How many understand what they're getting into? And *why*."

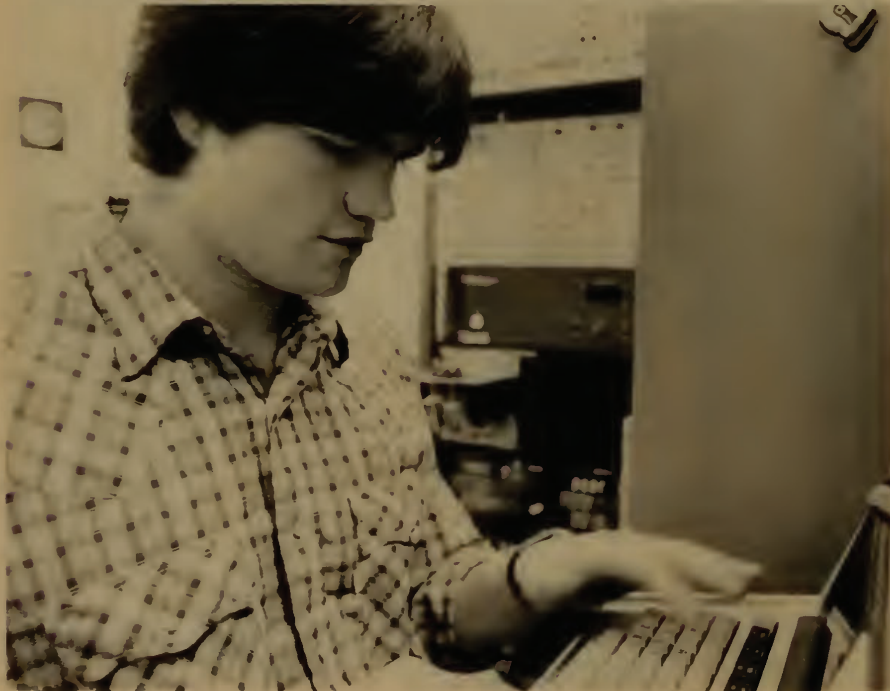
"Take the time," counsels Martin Hopkins. "The dividends will come in more and *better* job offers."

Bonnie Blanchon of Millipore concurs. "Don't be put off by the extra time in college that goes along with COOP. You'll be opening yourself up to new opportunities—both in college and later."

Junior Enis Konuk found the payoff back in the classroom following his COOP. The Turkish electrical engineering major wrote software for control systems at BTU Engineering, Inc., a maker of semiconductors located in Billerica, MA. "COOP is helping me digest the course work I completed before going out. And classes and projects are more relevant."

Richard A. Zeccola of IBM, echoes Enis' viewpoint. Zeccola is Project Manager of Printer Quality and Reliability at IBM's Endicott, NY, facility. He is also a COOP recruiter. IBM, he says, looks to

EE Major Rod MacLellan writing software at Sprague Electric Company.





COOP students for fresh ideas and to question existing company methods. "We've had three WPI COOP students at our Endicott plant," he says, "and we're batting a thousand."

IBM, Zeccolla reports, recruits students who are technically prepared, mature and ready to work on a team. "We find all those qualities in the WPI students we hire, plus the ability to grasp problems and to present themselves professionally." WPI's emphasis on student projects, he believes, is a key source of this capability. "Our biggest problem," he concludes, "is that we can't hire *enough* WPI students."

Diane Peterson's COOP experience challenged and rewarded her in much the same way that it has other students. Last year, as a junior, the Copiague, NY, computer science major designed a mathematical simulation of a military defensive probe being developed at the Westboro, MA, plant of GTE Corp. "It gave me a chance to apply what I'd learned in class—



Sherry Horeantopoulos

and put money in the bank for college."

Rod MacLellan, too, found the financial payoff of COOP especially timely: he was married recently. Rod finished his COOP in January at Sprague Electric Co., a semiconductor manufacturer and major Worcester employer. His assignment there, writing software for monitoring semiconductor wafer processing, will enable him to follow a number of career directions and help him better define his curriculum and project goals back on campus. "It was a great confidence builder," he adds.

Michael Ridinger, Sprague's Manager of Device Development, was Rod's COOP supervisor. "Our COOP students work on current and important programs," he says, "not back-burner projects. They are hired as technicians, but they bring with them an added strength—an engineering approach to problem solving."

Adds Jerry Bouchard, Sprague's Manager of Technical Services, "We look for the kind of people who want to work at Sprague. We look for character, not just technical skills."

For junior Diane Peterson (left), COOP paid off in practical and financial terms. Enis Konuk, '85 EE (above), got a close look at the semiconductor industry.

Today, about 1,000 colleges and universities offer some form of cooperative education. Most are a curriculum option, but some are mandatory and built into the institution's overall educational program.

Both systems, of course, have their advocates. Thus, we can ask whether WPI's COOP program—which is strictly by choice—should be more regimented. Should it be mandatory?

Without exception, those interviewed for this story—students and employers alike—responded to this question with a resounding NO. But at the same time, most students heartily recommend COOP to their classmates, and employers regard COOP as vital to their long-term recruiting and everyday operations.

"We look for students who *want* the COOP experience," says Millipore's Tom Lavin, "not those who have no choice."

Off and Running

In a moving tribute, WPI inducts eight of its greatest sportsmen into the new Athletic Hall of Fame.

In his time, the late Harry L. Dadmun, Class of 1891, "Worcester's Fastest Human," was a world-class runner. He won the 1891 National AAU 1/2-mile Championship with a time of 1:59.2, a WPI record that stood for 60 years. He also won the French National Championship and dominated WPI opponents in every race from 100 yards to the 1/2-mile and the hurdles.

Dadmun and seven others were inducted, as charter members, into WPI's Athletic Hall of Fame. The induction came at a dinner ceremony attended by more than 200 at Homecoming Weekend in October.

Six alumni, a coach and a former athletic director constitute the membership of the Hall of Fame, an idea conceived a decade ago to honor the extraordinary athletic contributions made during WPI's more than 100 years of intercollegiate athletic competition.

Said Ted Coghlin, '56, who, with track coach Merl Norcross, co-chaired the organizing committee, "The dedicated efforts of POLY CLUB members, the Athletic Department, the Class of 1959 and many other volunteers gave life to this long-overdue concept. It's been a team effort all-around."

Dadmun's fellow inaugural members are Thomas W. Berry, '24; Albert J. Raslavsky, '39; Raymond J. Forkey, '40; Henry W. Nowick, '56; Edward F. Cannon, '68; Robert W. Pritchard, former athletic director and football coach; and Charles R. McNulty, a WPI coach for 37 years.

"Selection of members," said Norcross, "is based on their athletic ability, integrity, sportsmanship and character, with special emphasis on their athletic contributions to their WPI teams." In addition, membership may be offered to non-athletes who have provided distinguished service to WPI sports—for example, coaches, faculty and other alumni. Any member of the WPI community, past or present, may nominate candidates. Induction of additional members is planned on an annual basis.

Thomas W. Berry, '24, earned two letters in football and three

in baseball, but is better known for his exploits on the basketball court. He was a two-time All-New England center when the Engineers were New England champions in the 1919-20 and 1920-21 seasons. He played all but two minutes of the team's games in his last three years. He died in 1959.

Albert J. Raslavsky, '39, was also a three-sport man. He played end in the Engineer's first undefeated football season of 1938. In basketball he captained the team and made All-New England in his senior year. That season WPI went 13-3 and was ranked in the Top 10 in the region. He earned four baseball letters, serving as captain in his senior year. As a sophomore, he received offers from the Pittsburgh Pirates and the Detroit Tigers to play professionally. He is currently a plant superintendent at H. H. Brown Shoe Company in Worcester.

Raymond J. Forkey, '40, combined with Raslavsky to give WPI some of its best football, basketball and baseball teams. He is the only WPI athlete to earn 12 letters.

Forkey captained the football team in his senior year and at quarterback was a pivotal force on the 1938 undefeated team. In basketball he helped the Engineers compile a four-year 47-17 record, including the 13-3 team of 1938-39. He also captained the baseball team. Forkey is still an avid golfer and has done well in many local tournaments. Currently a WPI Trustee, he is the retired president of Coppus Engineering of Worcester.

Henry ("Hank") Nowick, '56, was another three-sport standout. In football he led the Engineers to their undefeated 1954 season. That year he was named to the *Chemical Engineering News* All-America team. In basketball he captained the team in his senior season and established a single-game scoring record with 33 points. He was also the leading pitcher on the baseball team, compiling a 10-2 record in four years. He is currently a senior engineering specialist for Monsanto Corp., in Indian Orchard, MA.



Dadmun, '91



Berry, '24



Raslavsky, '39



Forkey, '40



Two-time All America soccer star Edward F. Cannon, '68 CE MNS, at the Hall of Fame induction ceremonies. Offering congratulations, from left to right, are Peter Horstmann, '55 ME, Mark Mandel, Sports Information Director, and Alfred E. Barry, '57 ME.

Edward F. Cannon, '68, is currently assistant athletic director, a physics lecturer and the highly successful soccer coach at St. Anselm's College. At WPI he earned All-America soccer honors in 1967 and '68, when just 33 players in the nation, regardless of division, received that distinction. During his career at WPI the soccer team twice played in the NCAA Regional Tournament. He was also an excellent basketball player and was selected to the Worcester Holiday Tournament all-star team in the 1967-68 season; WPI beat Assumption and went on to win the tournament.

Robert W. Pritchard's name was synonymous with WPI athletics for 31 years. He was the school's athletic director from 1952-78 and head football coach from 1947-66. Under his leadership WPI's athletic program flourished. Among his most noteworthy accomplishments: his 1954 undefeated football team, which earned him a National Coach of the Year nomination; his

role in the planning of Harrington Auditorium; his induction into the National Association of Collegiate Directors of Athletics Hall of Fame; his role as founder of the NCAA's Drug Education Committee; and his ECAC James Lynah Award, for his contributions in intercollegiate athletics. He passed away in 1978.

Charles R. McNulty, who serves as WPI's coordinator of athletics and scheduling director, has been a coaching mainstay at the school for more than 37 years. He coached football from 1945-81, was head basketball coach from 1947-66 and was head baseball coach from 1946 until he relinquished the position last year. His other honors include the 1981 Jack Butterfield Award, for his devotion to the improvement of college baseball; and his 1968 award for "Contribution to Basketball," presented by the Worcester County Basketball Coaches, Sportswriters and Sports-casters Association, an organization that he helped create.



Nowick, '56



Cannon, '68



Pritchard



McNulty

A SHOT IN THE DARK



Sherry Horne/ampulix

Larry Katzman and Marshall Levine: Putting a lid on home heating costs.

The scene is a common one: an engineer buried in a foot-high stack of technical reports on some sliver of an esoteric field of interest. And not surprisingly, he's never heard of the author, in this case a Lawrence Katzman of the Boston area.

The reader is Marshall Levine, '55 ME, of Wayne, PA. It's the late 1970s. He's reading everything the National Bureau of Standards (NBS) can unearth for him on the subject of energy conservation in residential buildings.

Levine's interest in all this is honest enough. His career has been distinctive, working at the time under contract to the Commonwealth of Pennsylvania, examining how fuel oil dealers can best benefit from the developing market for home heating retrofit and replacement equipment.

He'd done computer modeling of retrofit strategies and payback potential to forecast homeowner response. He'd served on the Governor's Energy Council and was chairman of the Philadelphia Residential

Energy Task Force. All this during the highly charged era of OPEC scares and skyrocketing energy costs. And earlier, he'd developed highly sophisticated blood analysis technologies for the medical profession.

"The elegance and excitement of high technology," he now says, "was intoxicating, but often it seemed to serve relatively few people directly."

Sensing a need both to solve people's everyday problems and to apply his expertise, he and a clergy friend formed in 1979 the Institute for Human Development (IHD), a nonprofit community service group based in inner-city Philadelphia. IHD's Burner Bank furnace reconditioning center employed more than 100 local residents. Several other states are now following the IHD lead.

"Lots of gadgets were appearing on the market about then, boasting of energy savings far in excess of what logic would tell you." Besides, he says, lots of government fuel subsidy dollars were going up the chimney through the decaying, inefficient

furnaces of the neighborhoods. "The Burner Bank created warmth two ways—by employing people and by heating their homes for less."

Enter Larry Katzman. The reports Levine had poured over at NBS were the result of a four-year study Katzman had done of residential oil-fired heating system performance. And at Walden Research of Wilmington, MA, he'd developed standardized NBS tests for comparing the performance of competing furnaces.

Levine's reading told him right away that Katzman was the only real authority he'd found on the subject of home energy conservation. He had to meet this Larry Katzman.

"Marshall called me in late 1979," Katzman recalls. "He was the only person who'd ever contacted me about my work."

The rest of the story reads like an entrepreneurial *Who's Who*. Their combined experience and interest in energy issues and desire to form a small, private firm quickly led to formation of Thermal Data Corp. Combining their modeling, computer and marketing skills, they developed the Residential Energy Computer (REC), a self-contained sales tool designed to promote residential energy conservation with a structured, unbiased presentation.

In just 15 months, their initial \$4,000 investment jumped to sales in excess of \$1 million. Today, more than 1,200 units are in use by heating contractors, fuel suppliers and energy consultants coast to coast. The unit is carried in an attaché case by a salesperson and is programmed to show dollar savings and paybacks for a variety of heating alternatives, retrofits and upgrades.

"The REC is simple, it builds a low-cost econometric model, it answers the questions of the homeowner in just a few minutes—and it's ethical," says Katzman.

Adds Levine, "Marketing has always been a problem for contractors and tradesmen. REC is the catalyst for sparking the gap between product and market."

And, oh yes, to complete the story—only after a few of their earliest conversations did Levine and Katzman discover that they are *both* WPI graduates. A CHE major, Katzman graduated in 1963.

But that's not all. Hard as it may be to believe, both were active brothers in the same WPI fraternity—AΕπ!

Says Levine, "There was instantly a trust between us, a mutual recognition of capability and judgment that WPI had helped mold."

Sometimes a shot in the dark turns out that way.

MBTI IN THE WORKPLACE

Type theory defines personality as the way you prefer to see and react to the world. Does that affect the way you work?
Common sense—and the theory—say yes.

By Mary Ruth Yoe

Personality's role in the work-place is easy to acknowledge, hard to quantify. The successful librarian has one type of personality, most people would agree; the successful car salesperson another. Therefore, shouldn't it be possible to use a personality test to match job with applicant?

Such tests are available, yet few businesses use them in hiring. "Their degree of job-related validity is not high," argues Mary L. Tenopyr, division manager for resources and systems at American Telephone and Telegraph, "so they aren't used." Furthermore, the Equal Employment Opportunity Commission supports strict regulations, trying to ensure that screening tests are valid and do not discriminate against minorities. Employers, in turn, shy away from using personality inventories in hiring—avoiding both expensive validation studies and possible lawsuits.

Once people are hired and in the work-place, however, personality's effect on performance can be examined. Larger organizations, those offering their employees in-house career development counseling, often use personality tests in team building or as an advancement tool, especially for managers. "An ideal manager, if there is such a thing," says Thomas Stutzman, a professor in the School of Management at Rensselaer Polytechnic Institute, "has the perceptual skills to recognize the variables in people and in the environment and to vary his or her style accordingly."

Contemporary theory of management styles, adds John Clemens, a former marketing executive for the Pillsbury Company who is now an associate professor of management at Hartwick College, "defines management as accomplishing something through others. That means a leader must command a whole range of leadership styles, from wholly democratic through dictatorial.

"There are, of course, real problems with being a chameleon,"

Clemens continues. "Personality is a given. It is possible to make small, 2 or 3 degree navigational changes, but not to change course entirely." Still, modern management places a premium on interpersonal skills—and on such navigational changes.

Enter a little-known personality inventory with a loyal band of enthusiasts: the Myers-Briggs Type Indicator (MBTI), based on the work of two women, Katharine C. Briggs and her daughter, Isabel Briggs Myers. About the time of World War I, Katharine Briggs began to study the similarities and differences in human personalities. Then in 1923, she learned from reading the English translation of Carl Jung's *Psychological Types* that her scheme of personality, developed independently, was similar to Jung's.

Everyone intrinsically prefers a certain way of perceiving and judging the surrounding world: that is the basis of Jung's typology. His typology heavily influenced Katharine Briggs's own work, an influence that went against the academic grain. (While both women were well educated—the daughter graduating from Swarthmore at age 16—neither had done graduate work in psychology.)

"Although Freud and Jung were both given honorary degrees by Clark University before World War I," says O.W. Lacy, a clinical psychologist who is chief of career planning, testing, and placement at Franklin and Marshall College, "the science of individual differences as it grew up in America remained largely empirical as opposed to psychodynamic in theory, at least through World War II." Lacy pauses, then confesses:

"Jung was a pariah in academic circles. I used to read Jung as if he were Henry Miller." Even when psychodynamic theory crept into U.S. graduate schools, "the overwhelming training and emphasis was Freudian." Many people, Lacy explains, had diffi-

DO YOUR INTERESTS FLOW MAINLY TO. . .		DO YOU PREFER TO PERCEIVE. . .	
E	I	S	N
EXTRAVERSION	INTROVERSION	SENSING	INTUITION
. . . THE OUTER WORLD OF ACTIONS, OBJECTS, AND PERSONS?	. . . THE INNER WORLD OF CONCEPTS AND IDEAS?	. . . THE IMMEDIATE, REAL, PRACTICAL FACTS OF EXPERIENCE AND LIFE?	. . . THE POSSIBILITIES, RELATIONS, AND MEANINGS OF EXPERIENCES?

culty with some Jungian ideas, including his theory of a collective unconscious. The result was “a general ignorance about Jung.”

In 1942 Isabel Myers, who had caught her mother’s enthusiasm for a theory of types, began work on a research tool to indicate personality preferences or types. She would try out her questionnaire on family and friends, then revise it and try again. “Isabel Myers was working independently of an academic career track,” notes Lacy. “She did have a marvelous old-boy network because her father had been director of the National Bureau of Standards, and he had some clout.” Through her father, for example, Myers convinced a medical school dean to let her test his students, a study that expanded to produce MBTI results for more than 5,000 medical students and 10,000 nurses.

Henry Chauncey, then head of Educational Testing Service, learned about the indicator and proposed that ETS buy and distribute Myers’s test for research purposes. But not everyone at ETS was as impressed with Myers’s work as Chauncey, and although ETS published Isabel Myers’s MBTI manual in 1962, the inventory was effectively buried there.

Then in 1975, distribution rights were transferred to Consulting Psychologists Press—which sold a million copies within two years—and the Center for Applications of Psychological Type was organized to coordinate MBTI research. Today the national association of MBTI users has 1,900 members, including college and university researchers in personality, career counselors, therapists, and a sizable number of management consultants.

President of the Northeast Association for Psychological Type, SueLynn (her whole name) is also a consultant in organizational and management development at the Johns Hopkins Hospital. On a bright early-winter afternoon, she meets with four mid- and upper-level hospital managers. The four have already completed the 166-question indicator (a paper-and-pencil, multiple-choice inventory), and SueLynn will soon hand back the results—“an identification, not a measurement, of personality”—but first she explains the theory of types.

“Humans have two basic mental processes,” she begins, “perception, or perceiving information, and judging, or coming to a conclusion about the information gathered.” She pauses. “Take a minute and write your name using the hand you ordinarily don’t

use.” The four obey. The resulting signature, of course, is both harder to pen and harder to decipher. “Just as you’ve been born with a preference for handedness, you have an inborn preference for the way you perceive the world.” Still, everyone *can* write with the unfavored hand; in the same way, type preferences indicate areas of strength and areas for growth. With that point established, SueLynn begins.

Sensing (S) types gather information by using their five senses. They pay attention to facts, details, rules, and regulations. They are practical, down-to-earth, “reality-based.” Firmly grounded in the here and now, S types talk about the past and the present; their future is short-term, six months to two years ahead. They learn best in 1-2-3 steps, and they base their decisions on experience. Of the general population, about 75 percent are thought to be sensors.

Intuitives (N) types, on the other hand, use facts as a jumping-off point into possibilities, options, alternatives. “They’re always making connections,” says SueLynn. Intuitives speak in generalities, are most concerned with concepts, theories, world views. Although intuitives are good problem solvers, even after the problem is solved they continue to proffer new solutions. N types are always looking to the future, and they learn the concept first, then support it with facts.

“What does this mean in a work situation?” SueLynn asks her audience. Several things. For one, an S feels most comfortable with a project when it is immediately applicable, obviously useful, while Ns more easily take on long-term tasks. These preferences also influence the way people give directions. “The N will say, ‘Send a letter to Ms. Jones about our meeting,’” explains SueLynn. “The S will respond, ‘But what do I say?’ The S wants directions, examples, specifics, models.

“On the other hand, an S manager will say, ‘I want you to do this project, and here’s how I want you to do it’ and will go on to list step-by-step instructions. The N he’s instructing will say, ‘Why does S want *me* to do it? He’s got it figured out already.’ ” Nods of recognition all around the table.

“The next two types have to do with judgment,” SueLynn continues, “or how a person comes to a conclusion.” The thinking (T) types base their conclusions on logic and analysis. Their

DO YOU PREFER TO MAKE DECISIONS. . .		DO YOU PREFER MOSTLY TO LIVE. . .	
T	F	J	P
THINKING	FEELING	JUDGMENT	PERCEPTION
<p>... OBJECTIVELY, IMPERSONALLY, CONSIDERING CAUSES OF EVENTS AND WHERE DECISIONS MAY LEAD?</p>	<p>... SUBJECTIVELY AND PERSONALLY, WEIGHING VALUES OF CHOICES AND HOW THEY MATTER TO OTHERS?</p>	<p>... IN A DECISIVE, PLANNED, AND ORDERLY WAY, AIMING TO REGULATE AND CONTROL EVENTS?</p>	<p>... IN A SPONTANEOUS, FLEXIBLE WAY, AIMING TO UNDERSTAND LIFE AND ADAPT TO IT?</p>

style is impersonal—they don't take into account how a decision will affect other people. What they do require of a decision is that it "make sense." They are sure of their reasons for a particular course of action, and they expect that others can justify their decisions in the same way.

Feeling (F) types do *not* base their decisions purely on emotions, as the name seems to imply. Rather, they are also concerned with attitudes, beliefs, values, morals, and convictions. In making a decision, they worry about its effect on other people, and they tend to value harmony and avoid conflicts. Unlike Ts, feeling types often cannot give "reasons why" they have made a decision.

The decision-making preference is apparently the only one with a sex bias. Although 50 percent of the general population are thinkers and 50 percent feelers, men account for at least 60 percent of the thinkers, while women make up at least 60 percent of the feeling type. (This fact may testify to the influence that environment can have on type, or it may point to an inherent sex difference.)

On the job, Ts expect to be recognized for their competence; they find a raise, a change in title, or a bigger desk more meaningful than a verbal thank-you. But Fs want to be appreciated for "who they are, doing a job." With Fs, says SueLynn, "a manager should use the words 'special' and 'unique' and 'thank you,' and should use them often." In large organizations, these differences can be the root of morale problems, "because in most administrations, the top managers turn out to be Ts. They are, of course, very satisfied, because they're getting all kinds of T rewards—responsibility, big salaries, good titles.

"At the middle-management level, there are both Ts and Fs. The Ts at mid-level are more dissatisfied, because fewer T rewards are available, while the Fs are dissatisfied because the Ts at the top treat them like functions, not people—a T thinks that if you haven't been fired, you should know you're doing a good job." SueLynn's audience chuckles.

The bottom level of a bureaucracy, she continues, is typically filled with secretaries and clerks, usually women and therefore most likely to be Fs. "They are very dissatisfied because they're thought of as machines. Even Ts at the bottom are dissatisfied

because there are no T rewards except their paychecks."

Whether sensing or intuitive, everyone has a preferred way of perceiving; likewise, whether a thinking or feeling type, everyone also has a favored style of decision-making. Some people favor information-gathering over decision-making, and vice versa. According to type theory, the favored activity will be used most often in dealing with other people.

A preference for judging (J) characterizes about 50 percent of the population. Whether a thinking or feeling type, a J enjoys completion. Words associated with this type include: "wrap up, finish everything, no loose ends, organize." They make lists, have plans, live life with a calendar. Again, nods of recognition from the four managers as SueLynn speaks. "They have a need to be productive in order to feel good about themselves." As people who like to be in control, Js decide, then act. They are uncomfortable with sudden upheavals, and must plan for change. Therefore a manager should give them time to think about changes. "In other words," she jokes, "don't tell them on Friday afternoon that the office is going to be relocated on Monday."

The other 50 percent prefer information-gathering to decision-making. These perceiving (P) types, says SueLynn, "are often accused—most often by Js—of not being able to make a decision. They don't *want* to make a decision." Ps keep options open. They enjoy seeing the other side, getting new information. Although their upsetting habit of questioning conventional wisdom often pushes them to the far side of a bureaucratic organization, Ps come into their own in diagnosing and managing a crisis. Compared to Js, perceptive types seem more spontaneous, more flexible, more adaptable. (An aside: Of all the types, SueLynn adds, Ps "have the most highly adaptive behavior—after all, they have to make some decisions, in order to get through school and in order to be paid.")

The fourth and final preference expresses an individual's world attitude. Extroverting (E) types prefer to relate to the outer world of people and things—not because they like people more than their introverting (I) counterparts, SueLynn cautions, but "because they need to talk to understand. They are energized by being with people." E types make up about 75 percent of the population. Introverting (I) types, in contrast, are energized by

being alone. They relate most easily to an inner world of self and ideas; “they go inside to think.” Articulate, they usually think before they speak. (Again, some adaptation is obviously required on the part of I types.)

Now SueLynn is ready to show the four managers how to interpret their inventory results. Each person, she explains, has a preference for E or I, S or N, T or F, and J or P—in other words, each person will fall into one of 16 four-letter categories, such as ESTJ or INTP. But that isn’t the whole story. Each of those four preferences falls along a scale from 0 to 60; 0 is the dividing line between a preference and its opposite, and thus scores between 0 and 15 mean that a person may actually shift back and forth between two opposing types.

“So we should try to categorize people and treat them accordingly?” asks one of SueLynn’s listeners. “Well, yes and no,” she replies. At this point, the tendency is to categorize. Researchers have found that certain MBTI types seem to flock to certain professions.

When *Dragnet*’s Sgt. Joe Friday pressed for “the facts, ma’am, just the facts,” he was being true to type. STs, who have what SueLynn calls “a very firm personality,” are often police officers or members of the military. SFs, “who pay attention to facts, yet are people oriented,” make good social workers, caretakers, nurses, ministers, psychologists (not psychiatrists, who are often NFs), and physicians noted for their bedside manner. NTs, who “gather information and then apply logic to the possibilities,” are especially good at research, particularly in quantitative fields, and at dealing with organizations. NFs, “the most articulate of all the types,” are often journalists or novelists, counselors or psychotherapists.

Business administrators—leaders in industry, government, and the military—are often TJs. The two types most attracted to the sciences are INTJs and INTPs, people who seem to value knowledge for its own sake. And studies of extremely creative people—Nobel laureates, etc.—have found that creative people tend to be Ns: by intuition, they are able to see around the corner.

Still, categorization is exactly what Jung feared: in letters to Katharine Briggs and Isabel Myers, he wrote that he did not want the type scales to be used as labels. “Each type serves as a resource to the other,” notes SueLynn. “It is extremely important that people do not use type to stereotype or pigeonhole—in the work-place or anywhere. A perceptive type *can* get the job done, a sensor *can* have a plan for the future. To stereotype is to rob a person of his or her opportunity to develop, to change.”

“Type is just one of the many markers—age, sex, ethnic and religious background, even geography—that help us predict other people’s behavior,” says O.W. Lacy. “One’s appropriate type is not a cell from which there is no escape, but a home ground from which one can venture forth to live life more fully. Unfortunately, there is much in what we do with type that reminds people of the horoscope, and that is a constant danger.”

To help remove the Myers-Briggs Type Indicator from the realm of the horoscope, Lacy has spent much of the past decade in research “aimed at establishing the validity of the concept and the instrument.” In each of the past eight years, about 500 of Franklin and Marshall’s entering freshmen have been given the MBTI and two more established inventories, the Strong Campbell Interest Inventory and the Omnibus Personality Inventory. The results are used in academic, career, and personal counseling while the students are at F&M, and the information also adds to Lacy’s research. An analysis of results from some 3,500 students is under way with a colleague at the University of California-

Berkeley. “How the results of the MBTI correlate with the results from the other inventories will provide concurrent validity evidence.” Isabel Myers performed similar validity tests, but Lacy points out that he hopes “not only to replicate, but also to extend her results, with a different set of students, from different decades and different backgrounds.

“Knowing what a person’s type is,” Lacy asks, “can we predict what a person will do later?” To find out, Paul Leavenworth, formerly assistant dean of students at F&M and now a PhD candidate at William and Mary, will test some aspects of the MBTI’s predictive validity. Using F&M data, he’ll attempt to correlate a student’s type upon entering college with college leadership activities later. “For example, students who make Phi Beta Kappa tend to be intuitives—tend in fact to be IN-Js,” Lacy notes. “The J probably gives them the organization necessary for consistently realizing really good grades.

“Isabel Myers felt that the educational system begins to screen for type, and indeed it seems that sensing types and perceiving types tend to drop out a little bit as you go higher up the education ladder.” (The inference is that intuitive types, who find it easier to grasp concepts, and judging types, with their liking for completed projects, fit most neatly into the educational system.)

Another question worth asking is whether, compared to their numbers in the general population, certain types engage in certain activities in disproportionate numbers. Himself a 2,000-miler on the Appalachian Trail, Lacy has so far studied 96 men and 27 women who have also completed the trail. “The 2,000-miler is typically an introvert and more likely to be intuitive.” INFPs, for example, make up about 10 percent of the hikers sample, yet account for only 2.5 percent of the general population. And although 11.2 percent of men and 16.9 percent of women in the general population are ESFPs, “not a single ESFP has surfaced as a 2,000-miler so far.”

Meanwhile, research on Myers-Briggs in business and industrial situations is flourishing, with work ranging from how business people conceptualize to studies of different professions, such as banking and accounting, and the types they seem to attract. “There’s one problem,” admits Mary McCaulley, a University of Florida psychologist who is president of the Center for Applications of Psychological Type. “In business, you get so many judging and thinking types that it’s hard to have a significant representation of feeling and intuitive types in your sample.”

McCaulley, a consultant for the career-development programs of such corporations as Citibank and Honeywell, thinks that MBTI will become more and more important in the work-place, “especially in companies large enough to have in-house career development programs—quite often the MBTI is used as part of that program.” And organizational consultants, she says, keep adding the instrument to their kit of management remedies.

To gauge the impact of types on a team of eight people, say, a consultant might help a manager divide the group members into intuiting and sensing, introverting and extroverting. “In a 12-person office that complained of communications problems,” SueLynn says, “I discovered that 10 of the 12 people were introverting types. They simply had no inherent need to let the other people in the office know what they were doing.” The solution: the introverting types made an effort to be more communicative about business matters.

Employees exposed to the Myers-Briggs Type Indicator in the work-place often take it home at the end of the day: “The MBTI has wider uses than many instruments,” says Mary McCaulley, “because it concerns how you take in information and make decisions—in other words, everything you do.”



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Death of a star: In 1054, Chinese astronomers watched as a massive star, now known as the Crab Nebula, exploded. Space Telescope should let today's astronomers witness another exploding supernova—but in more detail.

ON THE OTHER SIDE OF THE ATMOSPHERE

... Space Telescope will see the universe
with 100 times more detail than ever before.

By Ann Finkbeiner

The heavens are filled with strangeness. Clouds of stuff as common as dust and hydrogen gas can thicken, condense, and heat until they create stars, but no one knows exactly how. Pulsars are unbelievably dense stars that spin at a quarter the speed of light. Quasars are ancient objects the size of stars, yet shine more intensely than the largest galaxy.

Astronomers have long lists of items to investigate; light alone carries the answers. Unfortunately, Earth's atmosphere—a fabric of cells of differing densities, which bounce, dim, and diffract the light—intervenes before the light reaches us here on Earth. That's why stars appear to twinkle.

The obvious solution to this interference: put a telescope above the atmosphere. In mid-1986 NASA will do just that, using the Space Shuttle to carry Space Telescope 320 miles above the Earth. Designed as the first permanent observatory in space, Space Telescope should spend the next 15 or 20 years gathering information from the light of stars and galaxies and sending it back to computers at the Space Telescope Science Institute in Baltimore. (The Institute, operated for NASA and the European Space

Agency by the 17-member Association of Universities for Research in Astronomy, Inc., is on the Homewood campus of Johns Hopkins University.) There, after the signals have been transformed and analyzed, Institute staff and guest observers will see the universe on the other side of the atmosphere.

Although its 2.4-meter mirror is not especially large, Space Telescope's power and precision are remarkable: compared to Earth-based telescopes, it will be able to see stars fifty times fainter with a hundred times more detail. While Earth-based telescopes have a limit of resolution (the smallest width that can be brought into focus) of around one arc second, Space Telescope's Fine Guidance Sensors can aim with an accuracy of .007 arc seconds. From Baltimore, that's like being able to pick out a dime in Chicago. Seeing farther out into space, of course, means seeing further into time, and Space Telescope will be able to see 98 percent of the way back to time's beginning.

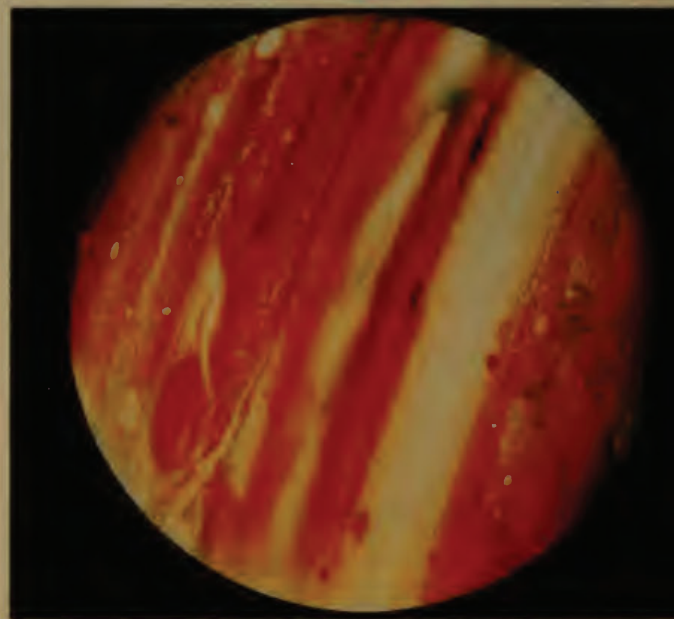
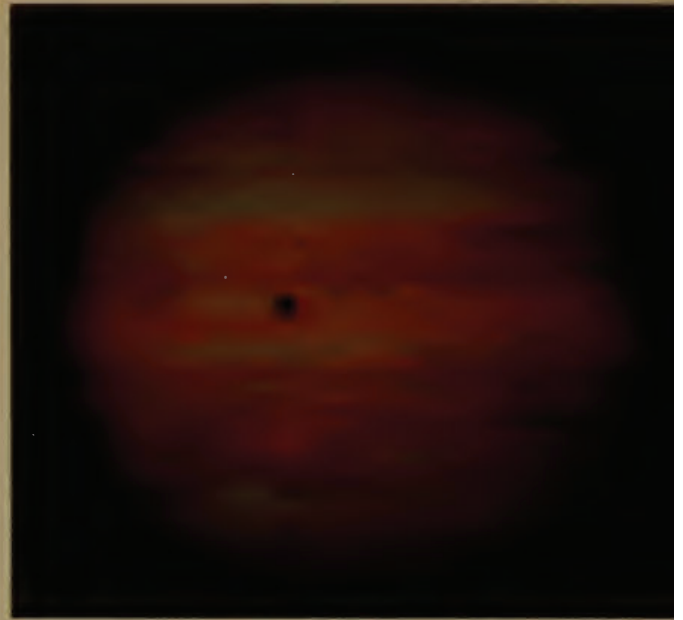
In addition to the Fine Guidance Sensors, Space Telescope will carry five instruments: two cameras, two spectrographs, and one photometer. They balance each other's talents: where one can provide a wide field of view, another has the resolution necessary for detail. Astronomers will use sometimes one instrument, sometimes several, to satisfy their curiosity about the planets, stars, galaxies, clusters, and the fate of the universe.

Planets

Oddly enough, astronomers know less about the history of our planetary system than they do about that of distant stars. So it is still a puzzle why the planetary atmospheres are so different. "Venus is hot, cloudy, and inhospitable," says Richard Griffiths, an instrument scientist for the Wide Field/Planetary Camera. "Mars is dry, dusty, not much water vapor," he continues. "Jupiter and Saturn are totally inhospitable—even if you got through their

The great red spot in Jupiter's atmosphere is hardly visible in this ground-based photo (top).

Voyager saw the planet more clearly (middle) and was able to focus quite closely on its turbulent spot (bottom). What the satellite saw from its flight past the planet, Space Telescope will be able to see from orbit around the Earth—and it can watch long enough to observe changes.



atmospheres, you'd be crushed by gravity before your feet touched anything solid."

Spacecraft would have to actually land on the planets to unravel these puzzles, but Space Telescope will answer some questions. Take the great red spot in the atmosphere on Jupiter, for instance. It has been known for a couple of centuries, says Griffiths, "and we still haven't figured out what it is." One of the most important things the Wide Field/Planetary Camera can do, he points out, is monitor changes on the planets over long time scales. "We should be able to watch the great red spot grow, or watch a storm on Mars build up and die away, or watch the dust move around in Mars's atmosphere." Then, he hopes, more will be known about the physics of planetary atmospheres.

The Wide Field/Planetary Camera, actually two cameras in one instrument, should provide information about the planets themselves, as well. Its special infrared and ultraviolet sensors will detect up to 80 percent of the light that's there. (The best photographic plate on the ground detects 1 percent.) The sensors are essentially light-counters; they will yield images in shades of bright and dark, something like regular photographs.

A spectrograph, by contrast, does not produce an image of the source it's looking at. Dennis Ebbets, instrument scientist for the High Resolution Spectrograph, says the spectrograph will use the telescope basically as a light bucket, to collect a lot of photons. "Then it spreads the light out into a spectrum according to wavelength, the way a prism does." Knowing the spectrum of an object lets an astronomer read its temperature, chemical composition, magnetic field strength, density, rate of rotation, and motion along the line of sight.

"The High Resolution Spectrograph, working with the Planetary Camera, can do 'weather reports' on Jupiter on a day to day basis," says Ebbets. "It can study Jupiter's northern lights. It can analyze the fumes from individual volcanoes on Jupiter's moon, Io. Earth is only one example of a planetary atmosphere. The bigger

question is, what are planetary atmospheres like in general?"

"Knowing what planetary atmospheres are like in general," says Richard Griffiths, "will help us understand how frequent or even likely is a planet like Earth."

"I don't think we're alone in the universe," says Duccio Macchetto, head of the Institute's Instrument Support Branch, and an instrument scientist for the Faint Object Camera. "But so far, no one has actually seen another planet outside our solar system."

The Wide Field/Planetary Camera will also be used in the search for planets around nearby stars. Many other stars, Barnard's star being the most famous, have wobbles in their orbits that might indicate planets. True, the Planetary Camera could only detect wobbles caused by large planets like Jupiter; in our solar system, at any rate, life on such giant outer planets is impossible. "But if the model for the formation of our solar system holds for others," says Richard Griffiths, "then where there are large planets, there will also be small ones."

"Whether we can make these observations is marginal," says Macchetto. "But we think the planets should be out there." Macchetto admits that, from a purely physics viewpoint, the discovery wouldn't be earth-shaking. But, he adds, "It'd give us a good, warm feeling, wouldn't it?"

Stars

Astronomers know that huge, hot, young stars often group in the spiral arms of galaxies, and that the groups frequently coincide with dense clouds of hydrogen and carbon monoxide molecules. They think the stars are born there, in nests formed by the molecular clouds.

Clouds of molecules, the theory goes, attract one another gravitationally, condense, and finally become compact enough that thermonuclear fusion begins. The star then catches fire in a wash of ultraviolet radiation. But this is specula-

tion so far, because the molecular clouds absorb the ultraviolet and thus shield the birth process from view. Astronomers pick up only the radio and infrared radiation from the clouds. But the Faint Object Camera should be able to detect some remnants of ultraviolet radiation from a newly born star. And by making observations over three years, astronomers should be able to use the Wide Field/Planetary Camera to watch matter condensing into a star.

Once the star is born and is burning normally, astronomers can predict its probable life history. No matter where they look, a star is going through one stage or another, so prediction is just a matter of statistics. Our sun, for example, should shine fairly steadily for another 4 1/2 billion years. When it finally dies, it will die in two stages: as a red giant, it will expand enough to engulf Earth's orbit; then it will shrink into a cold white dwarf.

Stars larger than the sun die less quietly. After a series of wild fluctuations, they become supernovas and explode. We see remnants of the explosion, hanging in veils and filaments of dust and gas. Using the Faint Object Camera, astronomers will search out a supernova soon after it explodes. If they watch long enough, perhaps 10 years, they can assemble a slow-motion movie of the supernova's expansion into space.

Or rather, they can watch the expansion of part of the supernova. For when one explodes, most of its mass falls back in toward its center. Since there is now no countering, outward push of nuclear burning, gravity's inward pull is fierce. The star contracts so far that electrons are pulled into their nuclei, changing the protons into neutrons. The resulting neutron star, having about the mass of the sun in a 10-mile diameter, is so dense that a spoonful would sink into the Earth's center.

"The magnetic field of a neutron star is very, very, very strong," says Richard White, instrument scientist for the High Speed Photometer, the telescope's simplest instrument. It counts the number of pho-

tons arriving from wherever the telescope points. While measurements can be made from the ground at the rate of 1,000 times a second, the photometer makes them at 100,000 times a second.

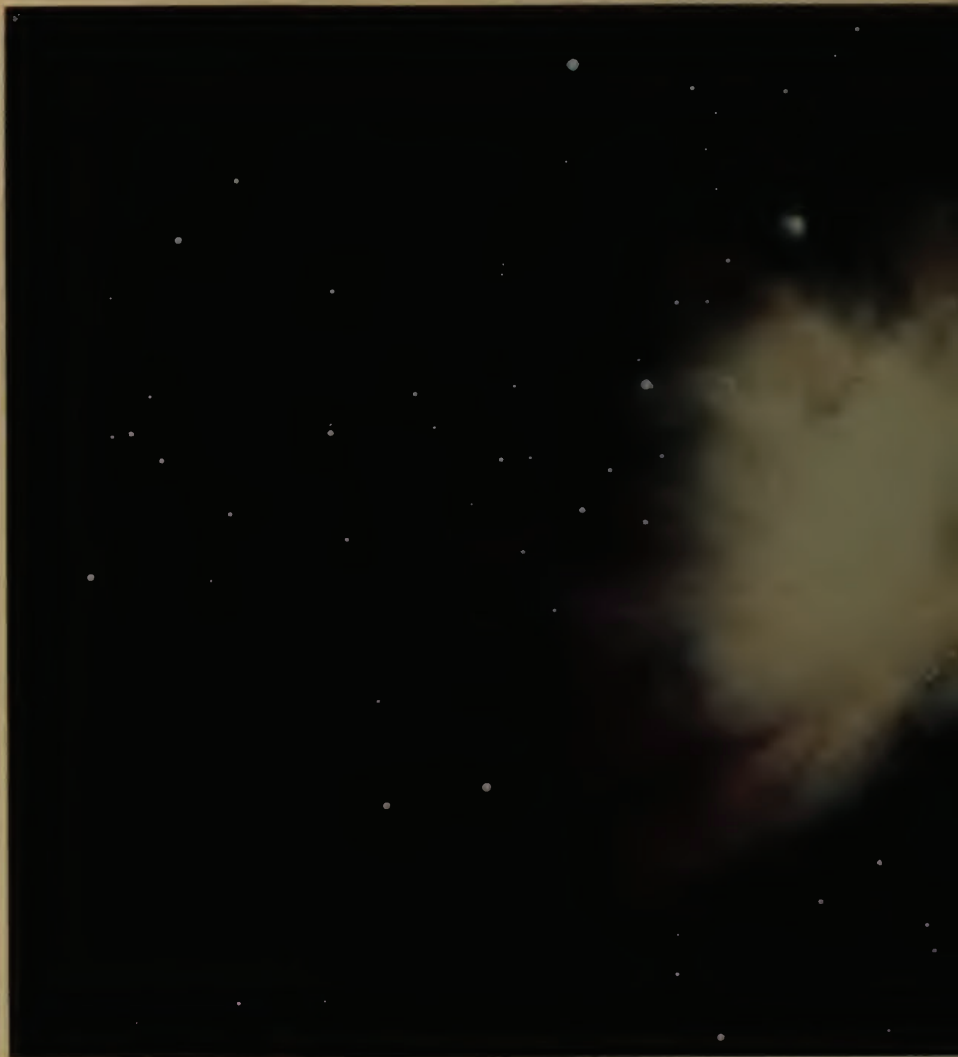
"In magnetic fields as strong as a neutron star's, weird things happen with light," says White. Light escapes from the star's magnetic poles more easily than at its equator. "Effectively, a neutron star has a little bright spot at its equator," says White. "Neutron stars are spinning around an axis, a pole. And every time the spot comes around, you see a flash." Neutron stars flash one to 1,000 times every second; they spin at one-fourth the speed of light.

Not all stars larger than the sun end up as neutron stars. A star four times the sun's size would continue to contract until its gravitational field was so strong that light could no longer escape. It would then be a black hole—and astronomers hope the telescope will let them "see" one.

Astronomers are reasonably certain black holes exist, and though, needless to say, they cannot literally see one, they think they can see its effects. The gravitational field of a black hole pulls in any surrounding material. But before going completely down the drain, the material whirls around the black hole, creating an accretion disk. "The stuff in the disk collides, creating friction," explains White. "Closer and closer to the inner edge of an accretion disk, it gets hotter and hotter. You can find a black hole by the light created by the friction in an accretion disk." In effect, then, a black hole does shine, though irregularly.

But neutron stars can have accretion disks, too. The telescope's High Speed Photometer can detect accretion disks from both neutron stars and black holes and identify which is which. Neutron stars are larger, their flashes regular and further apart. "If it is a black hole," White says, "they'll see irregular variations as fast as the Photometer can measure—100,000 times a second. With changes that fast, it has to be a black hole."

The Great Nebula in Orion (above) and the Veil Nebula in Cygnus (right) were named when a nebula—Latin for "cloud"—was just a dim patch seen by an early telescope. They represent nearly opposite events. Orion's clouds of gas and dust are raw materials which will collapse into stars, while the Veil's filaments—remnants of a dying supernova—expand into space. Space Telescope can watch both.





Galaxies

Astronomers know that galaxies come in types. Slightly flattened or spherical, elliptical galaxies are composed of older stars and contain little of the gas and dust that might create new stars. Spiral galaxies, like our Milky Way, have a large, dense bulge at their centers and spiral arms thick with young stars and gas and dust.

Early theories linked the two types in a sequence: ellipticals were supposed to evolve into spiral galaxies. Today, however, astronomers have their doubts. "Is the difference between ellipticals and spirals evolutionary," asks Duccio Macchetto, "or has it to do with the way they were formed in the first place? The theory now is that they were born different." So the High Resolution Spectrograph will look at clusters of galaxies for signs of evolution, to see if ellipticals and spirals are parent and child or simply cousins.

Another group of galaxies called active galaxies are less a type than a jumble. They have no particular shape, but all possess extremely small, exceptionally brilliant centers. In fact, the amount of light coming from the center is a significant fraction of the light coming from the rest of the galaxy.

Astronomers are highly curious about the nuclei of those active galaxies. "The nuclei of all active galaxies lie buried at the center of the nuclear bulge," says Richard Griffiths. Looking at the bulge with ground-based telescopes, astronomers can usually see only what Dennis Ebbets calls an "overexposed blob."

With the Telescope's Wide Field/Planetary Camera, however, researchers should be able to resolve "right at the dead center of that blob, one little super-bright point." So far, the most popular explanation for the bright nuclei is that such a blaze is actually the accretion disk of a black hole.

Active galactic nuclei resemble another curiosity, quasars. First observed 20 years ago, quasars are still the most distant objects astronomers see—hundreds of mil-

lions, even billions of light years away. In theory, that means they should be hundreds of millions to billions of years old, three-quarters of the age of the universe. Quasars are a hundred times brighter than the brightest galaxy and a hundred thousand times smaller than the apparent size of a normal galaxy. It's hard to talk about quasars and avoid hyperbole.

"Then there is the fuzz, as it's called, around a quasar," says Ralph Bohlin, an instrument scientist for the Faint Object Spectrograph. Working in the ultraviolet spectrum and on the same principles as the High Resolution Spectrograph, the Faint Object Spectrograph has lower resolution, but can see things that are much dimmer and much farther away. Things such as a quasar's fuzz—which astronomers think is really a galaxy. "Few quasars have been found to have underlying galaxies," admits Bohlin, "but so far, that's because of the limitation of the instruments." (To see the galaxies around quasars, astronomers can also use the telescope's two cameras.)

The number of active galaxies and quasars seem to increase with distance. In other words, the early universe held more active galaxies and quasars than does the present. Astronomers therefore suspect that galactic evolution, active galaxies, and quasars are connected.

Quasars, for example, might be the brilliant centers of early active galaxies. And active galaxies might be what the ellipticals and spirals looked like millions and billions of years ago—violent creatures, powered by black holes of incomprehensible size. Eventually, perhaps, such galaxies settle into middle age as the spirals or ellipticals we see around us. But some memory of youth may remain; most galaxies, including ours, probably have small or inactive black holes at their centers.

Clusters

Cosmologists—astronomers who deal with the origin, evolution, and end of the universe—have evidence that the universe ex-

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ploded into being 15 to 20 billion years ago. Since then, everything—space and time, matter and energy—has been drifting away from everything else.

“We know pretty much how the universe started,” says Institute director Riccardo Giacconi. “However, we don’t know how it went from the Big Bang to the universe we see today.” In its first instants, it is generally agreed, a chaotic universe blended uniformly into a primordial soup.

Today we see a much lumpier universe. “Galaxies are not uniformly distributed in space,” says Giacconi. “They seem to occur in sheets, in filaments, in knots, in structures separated by very large distances. There are islands of matter and islands of emptiness.” Stars collect into galaxies, galaxies into clusters of galaxies, clusters into superclusters separated by voids of millions of light years. Only on the largest scale—superclusters and beyond, a billion light years—is the universe uniform. How did the present structure develop out of homogeneous chaos?

“There are two main-line theories,” says Giacconi. Both assume that as the earliest universe expanded and cooled, clumps or inhomogeneities in the general uniform density occurred at random. “But what is the scale of these inhomogeneities? Is it small, of a size that could condense into a star or a galaxy? Is it much larger?”

“One theory assumes that small inhomogeneities can occur and that stars and galaxies formed first.” Stars, galaxies, clusters, and superclusters would merge by mutual gravitational attraction. This is the hierarchical theory.

The pancake model, on the other hand, theorizes that clumps the size of a star or galaxy would have dissipated in the early chaos, so that only supernova-sized clumps would have survived. “These largest inhomogeneities were in the form of pancakes, wide in one direction, narrow in the other,” says Giacconi. “These enormous clumps then fragmented, and out of the pieces came the clusters, then the galaxies, and finally the stars.”

The two theories also differ in the age

they assign to the galaxies. In the hierarchical model, galaxies formed almost at the Big Bang and are about 20 billion years old. In the pancake model, galaxies are younger, around 17 billion years old.

Here is a dispute the Space Telescope probably can resolve, for the Wide Field/Planetary Camera will be able to see approximately 13 billion light years back in time, far enough to see young galaxies—if the pancake model is right. “If we find absolutely no indication of galaxy evolution going back to 10 billion light years,” concludes Giacconi, “I think the pancake theory would be difficult to sustain.”

The Future of the Universe

Cosmologists not only want to look into the past, they also want to see into the future. They want to know whether the universe will continue to expand, opening forever. Or will it finally reverse and fall in on itself, closing down into a hot, infinitely dense and singular point?

The universe is unquestionably expanding, astronomers agree, but because the gravitational attraction of all its mass pulls it back together, expansion is slowing. Thus the fate of the universe depends on how much mass it has: An open universe will be populated sparsely, but if the universe is dense enough, the laws of physics indicate it will eventually pull together. Find the amount of mass and how far apart it is—in other words, find the density—and you know the fate of the universe.

Density depends in part on what astronomers call the distance scale. The easiest way to measure the distance to a star is called trigonometric parallax. Pure and simple geometry, trigonometric parallax is the most accurate of all the methods: Locate the star against a background of other stars and measure its apparent movement after six months. Then, knowing the size of relevant angles and the distance from one side of Earth’s orbit to the other, you can calculate the long arms of the triangle, the distance to the star.

Other, less accurate methods of measuring distance are statistical. That is, they depend on observed relationships: The farther a star appears to travel in one year, the closer it is. For a variable star like those called Cepheids, the longer the period of variation, the more intrinsically bright it is. The fainter a star of known brightness, the farther it is. The more intrinsically bright a star, the more massive. The more massive, the bluer.

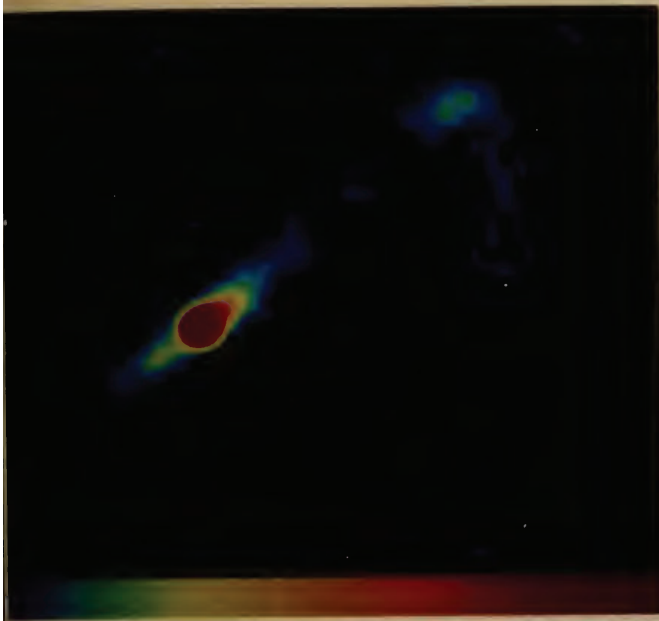
Such relationships begin to look like a house of cards, all resting on the parallaxes of a few nearby stars. “Parallax is the base of other measurements of distance,” says Alain Fresneau, instrument scientist for the Fine Guidance Sensors. “If you enlarge this base, you will improve everything.”

“For the moment,” he says, “we have good parallaxes of stars in the vicinity of the sun, up to 50 parsecs.” (That’s roughly 150 light years.) “With the Fine Guidance Sensors, it will be possible to go out to 1,000 parsecs.” That’s accuracy to a distance of 3,000 light years, to the arms of our galaxy.

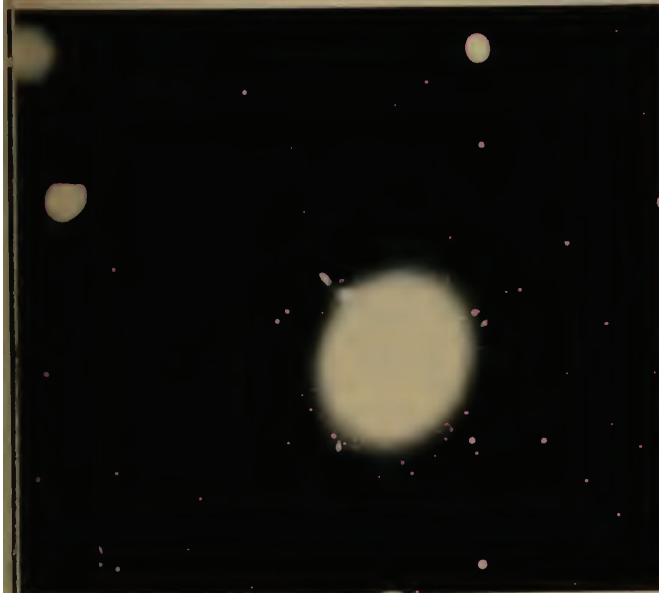
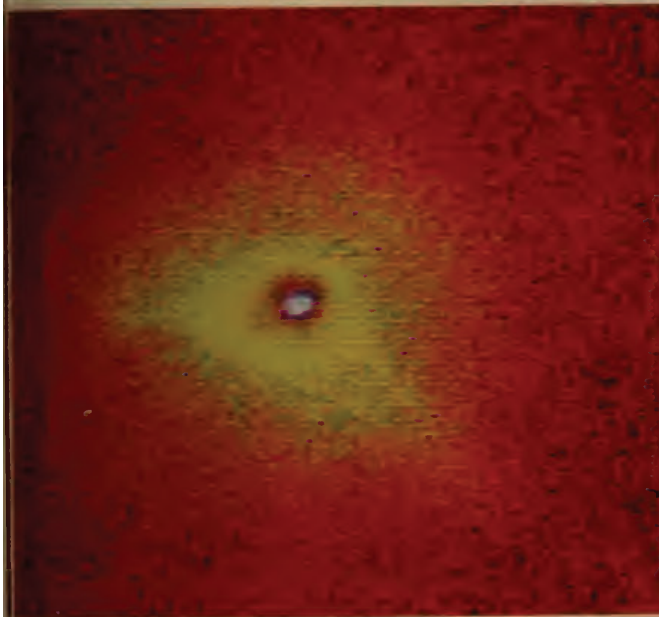
And it should be possible to go farther yet. The High Speed Photometer, Faint Object Camera, and Wide Field/Planetary Camera will refine measurements of stars’ periods, brightness, masses, and colors. Researchers plan to check distances derived from these relationships against distances derived from parallaxes—making the distance scale accurate out as far as the great clusters of galaxies.

Measuring distances is one step in measuring the universe’s density; calculating its mass is another. To estimate mass, astronomers use the same sort of relationships used to estimate distance, but on a larger scale. They begin with what they know: a bright galaxy has more mass. The way a galaxy rotates reveals its mass. The motion of galaxies within clusters reveals how much mass is in the cluster.

Yet when astronomers compare the amount of mass implied by brightness with the amount of mass implied by rotation or motion, they find discrepancies. Bright-



Three ways of looking at an active galaxy and its small, exceptionally bright center: Radio spectroscopy of the large radio galaxy NGC 315 (top) points out its mysterious jet with its two hot spots. The nucleus of M87, which also has a jet, is seen in the X-ray wavelength (middle). A ground-based, optical view of M87 (bottom) shows the nucleus as "an over-exposed blob." ST should resolve the dead center of that blob, a super-bright point that perhaps is the accretion disk of a black hole.



ness, which counts only visible matter, gives a considerably lower mass than the other measures, which count all matter. Therefore, 80 to 90 percent of the universe's matter must be dark—invisible. Astronomers call it the missing mass.

"We know where some of the missing mass is," says Neta Bahcall, one of the Institute's few cosmologists. "It surrounds galaxies, it is found in the clusters of galaxies, and even the bigger systems, the superclusters, contain it." The dark matter is evident only by its effects on the rotation and motions of galaxies. Looking around in the dark, Space Telescope will refine the measurements of mass it cannot see.

So far, astronomers can only guess at what the total of that missing mass might be. Currently, the favorite theory points to elementary particles of matter with so little mass that they very seldom bind gravitationally—yet exist in such great numbers that their mass is a significant fraction of the mass of the universe.

And then there's serendipity, quite literally a project in the Institute's original proposal. "The most interesting things, by definition," explains Ralph Bohlin, "are the ones we haven't seen yet." So 15 percent of Space Telescope's observing time will be labelled Director's Discretionary Time. It is precious time left open in a tight schedule to investigate the inevitable surprises, the things no one expected.

Anything else?

"We will be able to ask questions which seem crazy, seem fanciful to ask," says Riccardo Giacconi. "The fundamental question, I think, is whether the universe is precisely the result of the intrinsic properties of matter. Once you have the physical laws and once you're given the first fluctuation, does it all follow? If, after the first instant, everything was driven by necessity, then we want to understand that necessity. We are asking some of the most profound philosophical questions you can ask about the universe."

Ann Finkbeiner is a Baltimore-based freelancer who writes on science.

ROBIN HOOD REVISED

The legend of the merry outlaw began more than 700 years ago. His history is vague but, says a British historian, one thing is clear: Robin never robbed the rich to give to the poor.

By James C. Holt

Robin Hood is regarded by many, including some historians, as an archetypal hero who successfully defied unjust authority—personified by the wicked sheriff of Nottingham—and righted the ills of society by robbing the rich and giving to the poor. His legend has survived for more than seven centuries, with some changes and adjustments certainly, but with the essentials preserved: so far no film maker has armed Robin with a space-gun or dared to change the sheriff into a good cop.

But where did the legend come from, and how much of it is true? The story has been told and retold so often, acquiring layer after layer of accretions catering to the tastes of each new generation. What do we really know about Robin Hood?

The first known reference to Robin Hood occurs in a version of William Langland's *Piers Ploughman*, composed in 1377, in which Sloth is made to say:

I do not well know my Paternoster as the priest sings it.

But I know rhymes of Robin Hood and Randolph Earl of Chester.

So far so good, but the question of origins remains, for plainly Langland's "rhymes" were already current. How old was the legend when he alluded to it and how was it transmitted?

The first tales to survive in manuscript come from about 1450. *Robin Hood and*

the Monk, found in a manuscript collection that includes a prayer against thieves and robbers, is a thriller, a story of treachery and revenge. Robin is betrayed to the sheriff by a knavish monk and is then rescued from Nottingham Castle by Little John and the rest of the gang. *Robin Hood and the Potter*, part of a manuscript collection of romances and moralistic pieces probably written shortly after 1503, is by contrast almost a burlesque. Robin, after challenging and fighting a traveling potter, takes the potter's dress and wares to inveigle his way into Nottingham Castle and lure the sheriff to the outlaw lair in Sherwood.

The *Gest of Robin Hood*, most probably written in the 15th century, is a collection of the current tales of Robin Hood. It attracted the attention of early printers, and between the last years of the 15th century and the middle of the 16th century there appeared no less than five editions of this lengthy poem describing the deeds (gest) of Robin Hood. The *Gest*, a minstrel's serial to be recited at intervals, includes what is perhaps the earliest story of all, the tale of the impoverished knight. In this story, Robin assists a knight who has mortgaged his lands to the Abbot of St. Mary's York, by robbing the monks themselves to repay the loan. The *Gest* also includes the encounter of the King and Robin in Sherwood Forest and a summary tale of Robin's death at Kirklees.

These early versions contain nothing of the legend that is taken for granted by 20th-century readers. There is nothing of King Richard the Lionheart or of his ill-famed brother, Count John; the only king given a name is Edward "our comely king," which leaves a wide choice—by 1327 there were three Edwards.

There is no Maid Marian; she only came into the story about 1500, when it was already centuries old. Robin is not of noble birth; that was a social gloss first applied in the 16th century and given color by fictitious pedigrees of the 18th century which made him Earl of Huntingdon. In origin, Robin Hood is a simple yeoman.

He did not lead the English resistance to the Normans; that element came into the legend in 1819, with Scott's *Ivanhoe*. He does not resist royal taxes; the only tax mentioned in the earliest tales is pavage, a tax imposed for the paving of market-places and the like. And Robin, far from resisting the tax, is trying to levy it.

The earliest tales contain next to nothing of Robin's robbing the rich to give to the poor. That he was a "good outlaw" who "did poor men much good" was tacked on to one tale almost as an afterthought.

"Robin Hood and Maid Marian in Their Bower," from Bold Robin Hood and His Outlaw Band, "penned and pictured by Louis Rhead" (Harper & Bros., c. 1912).



The Newton-White Collection, Special Collections Division, Milton S. Eisenhower Library, Johns Hopkins University; all other illustrations are from the university's John Work Garrett Collection.

The question of Robin Hood's origins remains, and there are several routes to an answer. One, of course, is to identify the "real" Robin Hood. The earliest candidate for the role is one Robert Hod, who was recorded as a fugitive before the King's justices at York in July 1225. The account recurred in the following year when the name appeared in the more colloquial form, Hobbehod. Unfortunately, the plea roll which might have contained details of the charges against him has not survived. Only one thing is certain: Robert Hod had fled the jurisdiction of the court. He was an outlaw. He is the only possible original of Robin Hood, so far discovered, who is known to have been an outlaw. Without more evidence, however, the matter is inconclusive.

Another path is the study of literary analogues. This approach links the legend with some of the knightly romances of the 13th century, particularly the tales of Fulk fitz Warin, a baron of the Welsh Marches who was an outlawed rebel against King John (1200-3), and of Eustace the Monk. This monk took to the woods in 1203 against his lord, the Count of Boulogne, and ended his days as a soldier of fortune when he was defeated at the battle of Sandwich in 1217. Fulk and Eustace live their lives as outlaws in the forest, just as Robin Hood does. All show a remarkable prowess with arms. There is no one to resist them; they may be undermined by treachery or overpowered by numbers but, if so, they gain release through skillful ruse and the base stupidity of their captors. Some of the analogous material must have been transmitted from one tale to another.

Approaching the legend through its geographic background links it with the great baronial estates of Pontefract, which encompassed parts of both Lancashire and Yorkshire and through which the major roads north from London led. Barnsdale and Clitheroe were both Yorkshire properties of the de Lacy family, lands which came to the earls of Lancaster through the marriage of Alice de Lacy to Thomas of Lancaster in 1292. The yeomen who served, and the minstrels who often stayed



*When "Robin Hood meeteth the tall Stranger on the Bridge," Little John dunks the outlaw. From *The Merry Adventures of Robin Hood of Great Renown*, illustrated by Howard Pyle.*

at, such households helped disseminate the legend throughout the Pontefract holdings—and beyond.

Finally, there is the study of names: not place-names, for they mark the subsequent dissemination of the legend, but surnames in the form of "Robinhood" or some equivalent. The earliest example has long been thought to be Gilbert Robinhood, who appears in Fletching, Sussex, in 1296. Other examples occur in London in the early 14th century. (There is no difficulty in understanding how the fame of the legendary outlaw might have been carried from Barnsdale in south Yorkshire down the Great North Road to the London taverns. In contrast, Fletching, to the south of London in Sussex, seems a far cry from Barnsdale: but not in terms of feudal property, for the lord of Fletching in 1296 was

none other than Thomas of Lancaster, husband of Alice de Lacy of Pontefract.)

Such evidence is admittedly wondrous thin and the logic finespun. After all, the name Hood was not uncommon; men called Robert Hood appear frequently enough in the existing records to preclude the snap identification of any one of them with the legendary outlaw. But the combination Robinhood is extremely rare. Even so, all such surnames could simply be dismissed as straightforward patronymics. In the same vein, children of a Robert Hood could also be known as fitz Robert, or Robertson, or Robinson, or Hudson, or Hodson, or even just plain Hood. And, more commonly, they were. In fact, Robinhood was a very rare form of surname, and so the hunch, the historian's sixth sense remains: The tales were sufficiently well known by the end of the 13th century to account for the adoption of a rather strange surname.

The weight of the accumulated evidence indicates that the legend's central locus is Barnsdale. (Most probably, Nottingham was later emphasized simply because it was a larger, better-known town.) The first tales, like that of the knight in debt to the abbot, had a knightly flavor that seems suited to a 13th-century audience. And it is likely that the tales have at their base a real outlaw.

An exciting new lead has recently been found by Dr. David Crook of the Public Record Office, London. Dr. Crook has now found yet another Robinhood surname (which is the subject of a note by him shortly to appear in *English Historical Review*). The name occurs in the Memoranda Roll of the King's Remembrancer of 1262, where the Prior of Sandford, Berkshire, was pardoned a penalty imposed on him for seizing the chattels of one William "Robehod," fugitive.

That mention advances the earliest of such names by a matter of 34 years. And it has proved to be of much greater significance. For, by the luckiest chance of survival, the entry on the Memoranda Roll can be matched with an entry on the roll of the Justices in Eyre in Berkshire in 1261. The Eyre entry is an indictment of a crimi-

nal gang, both men and women, suspected of robberies and the receiving of robbers, who had fled the jurisdiction of the court and were outlawed. They included William, son of Robert le Fevere (Fevre=Smith), and there is no doubt, considering the precise details available, that this man and the William Robehod of the Memoranda Roll are one and the same.

Quite simply, somewhere along the administrative chain between the Justices in Eyre and the Remembrancer in the Exchequer, one of the clerks—perhaps even the Remembrancer's clerk—changed the name. And what led the clerk to do so was the fact that William son of Robert was a member of an outlaw gang indicted for robbery. The outlaw became William Robehod.

The clear inference is that the man who changed the name knew of the legend. And thus the earliest reference to Robin Hood as a legendary figure must now be taken to be not 1377 (*Piers Ploughman*), but 1261–2. In all senses, that is an enormous advance.

This discovery by Dr. Crook demonstrates beyond serious doubt that Robin Hood surnames did indeed derive from the legend, rather than the reverse. But its importance stretches far beyond that. First, the new discovery imposes strict limits on the search for a historical Robin: All candidates later than 1261–2 can now be firmly eliminated. Much Robin Hood scholarship concerned with establishing him in south Yorkshire in the 1320s must now be jettisoned. Robert Hod, fugitive of the York justices in 1225, now has a clearer field; indeed, the nickname that he was given on the rolls in 1226, "Hobbehod," may well reflect the emergence of the legend.

Old, well-known evidence, which has been played down in recent years, suddenly looks refreshed. The Scottish historian John Major, writing in 1521, believed that Robin Hood and Little John were active in 1193–4. A tomb with epitaph that survived at Kirklees in the late 17th century recorded that Robin died in 1247. The persistence with which these and other sources associated Robin with the late 12th and early 13th centuries is now explicable. John Major was probably right, and many modern scholars are proved wrong.

A second consequence of Dr. Crook's discovery will be more difficult to assess. Until now literary scholars, relying on 1377 as a rough point of origin for the legend, have assumed very reasonably that the analogues that the tales of Robin share with the knightly romances of the 13th century arose in the earlier knightly romances of Fulk fitz Warin and Eustace the Monk and spread to the later yeoman ballads of Robin Hood. It now appears that romances and ballads all took shape at one and the same time; it is easier to understand how they came to share material, but it can no longer be so certain which was the source and which the recipient. The earlier the Robin Hood legend is pressed, the more original it is likely to be.

A third consequence is even more important. If any real Robin Hood existed, it was thought, he had to exist before 1377, the *Piers Ploughman* reference. Early manuscript tales of Robin appearing around 1450 then made sense, because it seemed reasonable that a story should take 50-odd years to move from fireside tale into written form. But an interval stretching back from c.1450 to before 1261–2 is a much more serious gap. The inference is that the stories known in 1261–2 by the clerk who called the outlaw William son

Perhaps the earliest tale of all: "Merry Robin Stops a Sorrowful Knight." The Howard Pyle illustration appears in the 1925 edition published by Scribner's.



of Robert "Robehod" were probably very different from the diversified tales which appear in written verse from the middle of the 15th century.

What went on in the intervening years? There are only a few indications of what the Robin Hood stories contained at any particular point. In 1432, for instance, the clerk of the sheriff of Wiltshire concocted an acrostic in his parliamentary return for the county that associates "Reynold" with Robin's gang: From that clue, it seems certain that the clerk knew the tale in which Little John assumed the alias of Reynold Greenleaf—or that he knew some similar yarn. The tale of the King's visit to Sherwood is plainly based on the progress of Edward II through the northern counties in 1323; therefore it cannot have been embodied in the legend before that date. Besides those two reasonably fixed points, it is possible to say that some elements in the legend—such as the tale of the Knight and the Abbot of St. Mary's, with its connections to Barnsdale, where the tales are thought to have begun—are likely to have been earlier, others later. And that at present is all we can say.

Within this long period of gestation there are continuous, consistent themes. In 1261–2 the legend was known to a clerk at work most probably in the Exchequer—in our parlance, the clerk was a civil servant. So the legend was circulating at that social level. What triggered the clerk's con-

sciousness was not a tale of some heroic medieval prototype of Che Guevara but the record of a gang of outlawed criminals: robbers and receivers of robbers. The same statements can be made about the references to Robin in the late 14th and 15th century. Such references come mostly from a middling social level and they are largely derogatory. (The sheriff's clerk in Wiltshire in 1432 is apparently the first to describe Robin as a good man. He included in his acrostic the phrase, "Good man was hee.")

The story's origins are intermingled with the aristocratic and gentle household; the geographic detail both in the tales' content and in the distribution of personal names suggests that one great household, that of Lacy/Lancaster, played a role that is still reflected in the evidence. The legend's heroes are yeomen—middling household

officers, youths at the beginning of their careers. The tales are remarkable for the absence of sex, family, and family property. They were retailed by minstrels who passed through, or who were permanently employed by, the household.

And that is how the legend spread and changed. Such households were itinerant. Yeomen in particular ranged afar as archer-bodyguards, messengers, sometimes as foresters and huntsmen. Minstrels, above all, traveled, performing not only before noblemen and gentry but also before bishops, in monasteries, and especially in the marketplace; anywhere, indeed, with a sufficient audience to suggest the possibility of reward. The legend's resulting diversification was already apparent in the first surviving tales. There are scenes in *Robin Hood and the Potter*, for example, that would have made the most sense, and perhaps had the most immediate appeal, to the folk of Nottingham.

By the middle of the 14th century, Robin seems to have been invading popular iconography. The sculptures in the north aisle of Beverly Minster (c. 1340), which celebrate the Beverly Guild of Minstrels, include a spandrel carving of a remarkably convincing longbowman. Furthermore, one of the misericords (c. 1430) in St. Mary's Beverly, which was the Guild's church, has been taken by some to represent Robin Hood and the King.

The most important development of all was that the legend overflowed the bounds of minstrelsy and invaded both folk festival and theater. Much new light was shed on this development by David Wiles's *The Early Plays of Robin Hood* (Boydell and Brewer, 1981). Indeed, Wiles is disposed to argue that in the developing tradition, the plays were primary and the ballads secondary. This is unlikely to be accepted. Still, Wiles rightly draws attention to the fact that the first recorded performance of a Robin Hood play took place before the Mayor of Exeter as early as 1427.

Certainly within 50 years or so of that date came a theatrical development that involved Robin Hood in the May Festival, first as a participant in the May Games and ultimately as King of May. It was in this last development, in my view, that Robin at last—near the start of the 16th century—



"Robin Shooteth his Last Shaft," by Pyle. ". . . and sett . . . mine arrowes at my feete," says Robin in the Gest.

acquired the reputation of robbing the rich to give to the poor.

The celebration of the Spring Festival is, of course, very ancient. In medieval England it began with youths and maidens returning from the woods at dawn on the first May morning, adorned with sprigs, branches, and flowers. As they processed, they decorated houses and sought payment for their display. This collection, "gathering," or *quete* was an almost inevitable concomitant of such processions.

Now, what could be more natural than that the most famous human denizen of the greenwood should accompany the youth on their return? And what more suitable role was there for the most successful of all robbers than that he should be put to the charitable purpose of conducting the *quete*? For that is plainly what Robin did.

Robin Hood's gatherings, which begin to appear in local records before the end of the 15th century, are not riotous assemblies of men but charitable collections of money. In some southern townships, especially at Reading and Kingston upon Thames, these celebrations were controlled by the church wardens and are recorded in their accounts. At Kingston, the wardens provided for the expense of the

display: Kendal (green) cloth for Robin, Little John, and Maid Marian, white cloth for the Friar, and other items. The wardens received sums from the gathering.

And, perhaps most significant of all, the wardens accounted for expenditures on items that indicate how the gathering was done and how many contributions were expected: in 1506, 4s. 2d. to John Painter, who supplied 1,000 "liveries" or badges, 3s. 8d. to William Plott, who supplied 1,200 "liveries and 40 great," and 10d. to the same for 2,500 pins. Robin had become the central figure in a flag-day.

A flag-day is an occasion, now almost peculiar to Britain, in which ladies of charitable instincts conduct well-organized collections by selling lapel flags or badges—in aid of wounded veterans before Remembrance Sunday (when the badge is a Flanders poppy), or for the national Life-Boat Ser-

vice, or for national societies for the protection of children or the support of orphans.

Robin collected from those who had money to give and accounted for his collection to those who administered the charitable funds of the parish. Thus he took from the rich to give to the poor.

This could have happened by a kind of easy elision of associations. Or it could equally have been the brainstorm of some long-forgotten church warden who envisaged exploiting Robin's reputation for charity. At all events, it left an enduring mark on Robin's reputation.

Something else also endured. At Kingston in 1506 the contributor bought a pin or livery great or small. The livery was a sign that he had joined Robin's *mesne*, band, or company. Those who buy their flags on similar charitable occasions today rarely reflect that they identify themselves with a mark that originated as a feudal livery—or with an outlaw hero.

James C. Holt is the author of Robin Hood (Thames and Hudson, 1982). Professor of medieval history at the University of Cambridge, where he is also master of Fitzwilliam College, Holt is president of the Royal Historical Society. He first became interested in Robin Hood when he taught at the University of Nottingham.

There Are Jobs Out There

But finding them may take more than a degree, say five young alumni.

By Ruth Trask



Frederick Rucker, '81 ME, and Michael Graham, '74 MG, responding to questions at a recent recruiting workshop on campus.

The theme of WPI's recent annual Placement Seminar was ominous enough: "The Student Hits Hard Times." But alumni Judy Nitsch, '75, Phil Cameron, '79, Fred Rucker, '81, Jack Zorabedian, '72, and Michael Graham, '74, told an understandably attentive audience of WPI seniors that there are indeed ways to succeed in a tough job market.

First came a humorous "Star Wars" slide show depicting do's and don'ts for job seekers, given by recruiter Frank Consoli of Procter & Gamble. Then Dr. Spencer Potter, placement director at Clark University, moderated the main event: the alumni panel discussion, arranged by Bill Trask, WPI's director of graduate and career plans.

Fred Rucker, '81 ME, a manager in the equipment engineering department for AT&T Long Lines, advised the seniors, "Know the company you're interested in. Know yourself. Sell yourself. Be honest enough to let the recruiter know that you want to succeed—that you want to earn money. Don't say something vague about wanting to work with people."

When Rucker started with AT&T, he worked in operations. Subsequently, he held an engineering and management post. He is now moving into a corporate personnel position in New Jersey, where he will employ his general management skills.

"I used three different résumés as a senior," said Phil Cameron, '79 CE, a senior project engineer at Clairol. "I wanted to keep my options open." First, he asked himself, "What kind of company would use a civil engineer? How could I fit in?"

Cameron not only was interested in hearing the recruiters' questions, but also

turned the tables. "I asked them about their experiences with the company."

He admits it may seem odd that a CE works for Clairol, but he found what he wanted at Clairol in general management. Initially a project engineer concerned with new products, he later became an on-line supervisor in packaging and worked in industrial engineering.

"By the time I returned in April from my senior semester in London," Judy Nitsch, '75 CE, said, "the recruiters were gone. I contacted companies on my own."

One company she wrote was Schofield Brothers, Inc., Consulting Engineers and Land Surveyors in Framingham, MA. "A WPI graduate hired me as a project engineer." Within three years she was named vice president of a Schofield division, Freeman Engineering Co., in Attleboro. In 1982 she joined Allen & Demurjian, Inc., Consulting Engineers, Architects and Land Surveyors, Boston, which recently promoted her to vice president.

Nitsch emphasized that small companies, like Schofield and Allen & Demurjian, should not be overlooked. "They're easy to check out and they may give you job offers sooner than larger ones!"

Michael Graham, '74, has a BS in management engineering from WPI and an MBA from RPI. "But I didn't go directly from WPI to RPI," he reported. "I feel it's a mistake to start on your MBA as soon as you graduate. Get some professional experience first."

Like Judy Nitsch, Graham believes that small companies have much to offer, in-

cluding "the chance for rapid advancement." In 1974, he joined Albany International, a high-tech fabric company, rising quickly through the ranks.

In 1980, he became affiliated with Bausch & Lomb, a manufacturer of contact lenses, ophthalmic products and scientific instruments. At 31, he is a corporate director of compensation and benefits.

He's now also studying evenings for his PhD in industrial and organizational psychology at RPI. "Working full time and studying part time has been a successful formula for me."

"You may not stick with your first job for life," said panelist Jack Zorabedian, '72, a chemical engineer and quality assurance manager for new products at Digital Equipment Corporation. "While you're with your first company, get all the experience you can."

Zorabedian stressed that mechanical and chemical engineers should not be afraid to look at nontraditional companies for jobs. High-tech firms hire MEs, he said, for cabinetry and boxing, and chemical engineers for the manufacture of circuit boards and coatings. "As a matter of fact," he continued, "there's less competition for chemical-engineering applicants at high-tech firms than at chemically oriented companies."

Jack urged the seniors to highlight their achievements on their résumés. "If you've had a summer job, co-op or project experience, say so," he said. "Show the company that you have a record of getting things done. It's vital to your job search."

Riding the Space Shuttle

Student projects will really get off the ground soon, with a little help from a friend.

Space, says Robert Labonté, '54 EE, "for all its allure, its mystique, its potential for enriching the human endeavor, remains a pretty unneighborly place for the engineer."

Labonté is Associate Department Head for Systems Architecture at MITRE Corporation, a nonprofit, government-supported firm that performs systems engineering work. Entering and using space—perhaps our most foreign and distant of research laboratories—present unprecedented challenges, he says. In that grand and weightless void, up is down and down is up. Yet, as we know, space can provide many conditions ideal for developing and testing advanced industrial, agricultural, medical and other technologies.

Sometime in 1985, NASA's Space Shuttle will once more thunder aloft, ferrying a precious payload of experiments adapted especially to the rigors of space flight.

Nestled near the center of its huge, 60-foot-long cargo bay will be a five-cubic-foot canister. Its 200-pound cargo will consist of five experiments designed, built and tested not by industrial engineers or government scientists, but by some of WPI's most creative and adventurous undergraduates. The sponsoring role of MITRE in this enterprise is vital to the project's success. Labonté's part in the program has been indispensable.

One of these self-contained experiments will be a solid-state multispectral Earth-imaging system—in lay terms, a sophisticated device to be used in observing and recording from space such earthbound phenomena as agricultural problems, weather patterns, earthquake activity and mineral deposits.

This project is the work of junior Gerard Earabino of Syracuse, NY, and seniors David Dymek of Fitchburg, MA, Frederick Gummow of Middlebury, MA, Peter Schibly of Green Bay, WI, and Eric Thune of Brooklyn, NY.

"Where the technology of our imager departs from that of conventional systems," says Thune, "is in how images are recorded." Virtually every satellite imager ever developed, he says, has relied on either film or an electrical or electromechanical scanning system. Military reconnaissance satellites, for example, often use a film canister which, when fully exposed, is jettisoned back to Earth to be retrieved and developed.

WPI's solid-state "camera," says teammate Dymek, has just three moving parts, needs little power and is less likely to break down under the tremendous vibrations of blastoff and re-entry from space. It's also smaller and lighter than its mechanical counterparts, weighing just 18 pounds.



Students Eric Thune (left), Gerard Earabino, Peter Schibly and David Dymek work on an Earth-imaging system. At right, Prof. Fred Looft (seated) and Robert Labonté want to place five student projects on a Space Shuttle mission.

The MITRE-WPI-Space Shuttle projects are part of NASA's Small Self-Contained Payloads program—best known as the Get Away Special (GAS). Professor Fred Looft, EE, heads the WPI program, which has come to be called the GAS-CAN(ister) Project.

Looft is as exacting a chief adviser to the 40 GASCAN project students as he is an administrator. "Working with NASA," he says, "you have to be. My job and that of the 17 or so other faculty advisors is to ensure the highest possible quality in each experiment while staying within budget and on schedule." It's a real challenge, but Looft seems to have the right stuff for the job: he has twice been an applicant for one of the most exclusive fraternities of all—a NASA flight team. "I may give it one more try," says the fit, bearded Looft.

Construction of the Earth imager began in October 1983. By spring, says Looft, a



working prototype will be completed. At that time, like other GASCAN projects, it will be turned over to a new project team, who will develop the imaging system that will actually go aboard the Shuttle.

Says Labonté of MITRE, "Teamwork is the key here. MITRE is providing financial and professional support; the students work over several years to put a working system into space.

"At MITRE, we're interested in study-

ing all of the operations involved in developing, launching and retrieving experimental packages using NASA space vehicles." The company, he adds, is also committed to providing students opportunities for professional-level work in this area. "We simply saw a fit between our objectives and those of WPI when we offered to donate the canister and our technical advice for student research."

Says Looft, "These projects are for real.

They call on students to prepare and defend proposals, meet strict schedules, integrate system elements and honor cost guidelines."

In all, 11 projects have been selected for further work. Eight are actual experiments, such as one to determine whether a gravity-free environment promotes the growth of large zeolite crystals. Another will develop a mechanical method for generating energy in space, using a non-chemical, non-photovoltaic method.

The remaining three projects will provide support for the technical experiments. One will develop and integrate a structure within the canister to support the five experiments—no trivial undertaking itself. Another team is publishing biannually the *Get Away Special Journal*, to keep all concerned parties well informed of the program's progress. The journal is especially vital since several successive teams will work on each project.

"We've encouraged projects that are not simply repeats of previous space experiments," says Looft. "These students, some of our best, must develop and test prototypes, build the space flight hardware, integrate the experiments into the GAS canister, launch, monitor and recover the packages, and finally analyze post-flight data. You begin to understand why this is a multi-year program."

"You might ask," says Labonté, "whether engineering students are capable of proposing, designing and developing equipment that can withstand the rigors of space flight *and* meet NASA safety and design standards. We would say emphatically, YES!"

Adds Looft, "Although faculty dedication is vital, we're not saying that, when a problem occurs, a faculty member will step in to solve it. We try to help students envision answers to difficult problems and broaden their perspectives—by bringing science, for example, into engineering. But the experimental protocols have been proposed by, and will be developed and implemented by, the students, not the staff."

WPI CLASS NOTES

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1916

J. Arthur Blair is currently residing in a Lutheran retirement home in Anaheim, CA. He says, "The weather is wonderful here. Ten times better than in Florida!" One of his sons lives nearby, and a secretary comes in twice a week to type his letters. Prior to retirement, he worked 42 years for Campbell Soup Co., Camden, NJ.

Carl Burgess writes that he still drives his car. Also, he "plays an adequate game of bridge and reads almost anything that is available in print." In 1964 he retired from the Northern Pacific Railway after nearly 48 years. He prefers the "harsh" Minnesota winters among his friends, rather than traveling to warmer climates.

Leslie Chaffee, of Tacoma, WA, who spent his career with the family lumber and wooden box business, Chaffee Brothers Company, Oxford, MA, is happy that he retired "in this glorious Northwest with its wondrous mountains." He is a past president of the National Wooden Box Association. Once active in town and church affairs in Oxford, he is a former vice president of the Webster National Bank. In Washington he has been a SCORE counselor for the Small Business Administration, a church

trustee and an active member of the Tacoma Engineers Club.

Tom Delaney says that he's been in good health generally but resents getting tired when he tries to do physical work. He had a slight stroke recently but he reports that now "it seems to be licked." Delaney resides in Branford, CT.

Ray Gambarano has a number of hobbies: acrylic painting, and making furniture, bird-houses and feeders, as well as clocks of all types. Through his hobbies, he has been featured in the local newspaper and on TV. In 1928 he manufactured some of his inventions in the automotive field in his own firm, Rico Mfg. Co. In World War II the company started doing tool and machine work, and the firm's name became Rico Machine Co. Ray invented, designed and built several types of machines. He sold the company in 1950.

Roland Horne retired in 1948 after 32 years in the U.S. Coast Guard and Geodetic Survey, now a part of NOAA. From 1949 until 1964, he taught engineering subjects at Los Angeles City College, where he "wound up as associate professor." The Hornes reside in Auburn, MA.

In 1957, after 41 years of service, **Merle Phipps** retired from Fiske Carter Construction Co. During his career he helped construct many buildings in Massachusetts as well as in the South, including schools, churches and cotton mills. Since retirement he has been enjoying "a little hunting and fishing."

C. LeRoy Storms, Class Secretary

1924

Reunion May 31-June 3, 1984

1927

"**Ted**" Lewis, father of the annual Shrine Maple Sugar Bowl football game between New Hampshire and Vermont, served as one of the honorary grand marshals in the pre-game Shrine parade held on Aug. 13th. Back in 1954, when Ted was Potentate of the New Hampshire Shrine, he thought up the bowl idea as a vehicle for raising money for crippled and burned children. Since that time, about \$2 million has been raised for the Shriners Hospitals for Crippled and Burned Children from the annual rivalry.

1929

Reunion May 31-June 3, 1984

1930

David Bragg, a retired 35-year employee of the Foxboro Co., was recognized as a 50-year member of the ASME at the October meeting of the Boston section of the society. Bragg spent most of his Foxboro career with the research department. He is the co-holder of one patent.

On July 14th, **Ed Delano** placed first in the men's 75-79 age group in the U.S. Cycling Federation National Time Trial Championships held in Tallahassee, FL. Says Ed, "I beat eight riders out of 116 who were 30 and above; six riders out of ten, 60 and above; and four riders out of five, 70 and above."

Catherine and **John Lampron, Jr.**, of West Springfield, MA, observed their 50th wedding anniversary on Oct. 12, 1983, with their two daughters, sons-in-law and five grandchildren on hand for the celebration. John, who is recuperating from a serious illness, would enjoy hearing from his classmates.

George Perreault is now living at a nursing home in Greenwich, CT. He and his wife, Dorothy, have one grandson and four granddaughters.

Carl Backstrom, Class Secretary

1934

Reunion May 31-June 3, 1984

1936

Ham Gurnham reports that the group of Sig Eps who started a chain letter 44 years ago are still corresponding and now meeting regularly. After 40 years of correspondence, the group met in 1980 in Williamsburg, VA; in 1981 in Bermuda; in 1982 in Myrtle Beach, SC; and in 1983 in Charleston, SC. "In June of 1985 we plan to meet in Mystic, CT, immediately following reunion weekend," he says. Included in the "Round Robin" group are **Dick Howes**, who thought up the idea in 1940, **Harry Anderson**, **Perry Clark**, **Harold Whitman**, **Len Humphrey**, '35, **Dick Merriam**, '35 and **Herb Gale**, '34.

1939

Reunion May 31-June 3, 1984

Arthur Mallon, a retired senior staff engineer from the EPA, has received a life membership

in the National Society of Professional Engineers.

1940

Robert Hewey, a member of the Bridgeport (CT) chapter of the Service Corps of Retired Executives (SCORE), is helping to set up a SCORE walk-in branch in the Danbury area that might serve as a starter for a local chapter. He attended the Harvard Advanced Management Program and has had extensive experience in manufacturing and technical operations with the Berol Corp. in Danbury, Curtiss Wright and Singer. Before retirement he was vice president of manufacturing for the Sprague Meter Division of Textron, Inc.

1942

The Newington (CT) Town Council recently adopted a resolution honoring **E. Curtis Ambler**, who has retired from town politics. He had served 10 years on the council, 12 years on the town planning and zoning commission and 35 years with the Newington Volunteer Fire Department.

1943

In September, **Leonard Hershoff** retired from IBM in Kingston, NY, and moved from Lake Katrine to the Greenbriar I retirement development in Brick, NJ.

1944

Reunion May 31–June 3, 1984

1946

Currently, **Bernard Beisecker** is director of manufacturing for Industrial Fasteners on Long Island, NY.

1947

George Bernard, Jr., is president of Magnat Corp. of Easthampton and Florence, MA, which has developed and is marketing a newly engineered belt dewatering press called the "H₂O Express." The machine is specifically designed for removing water from any paper sludge/slurry.

1948

Allen Mintz reports that his wife, Ruby, and son, Howard, won low net and were one off for low gross (among many) at the WGAM Mother-Son Tourney held at Pembroke (MA) Country Club in August.

Romeo J. Ventres has been elected an execu-

utive vice president of Borden, as well as president of the chemical division. He also was named a member of the office of the chairman. Previously, he was a group vice president of the chemical division, responsible for adhesives, energy resources and Canadian chemical operations. Starting with the division in 1957 as a project engineer, he was subsequently advanced to general manager of thermoplastic operations and vice president of the division. Before joining Borden, he was employed as an oil-industry engineer in the Middle East and by Atlantic Refining Co. in the U.S.

1949

Reunion May 31–June 3, 1984

Elzear Lemieux, a consultant for the M.W. Kellogg Co., Houston, TX, wrote "Data for Tower Baffle Design," which appeared in the September issue of the magazine *Hydrocarbon Processing*. He started with Kellogg in 1950 and has had numerous engineering and supervisory assignments. He holds BS and MS degrees in chemical engineering from WPI and a BA from Assumption. A licensed professional engineer in New York and Texas, he is also a member of the AIChE and Sigma Xi.

Sidney Madwed is with Attitude Developers and Consultants in Bridgeport, CT.

1950

Tejinder Singh, general manager of Bharat Petroleum Corp., Ltd., Bombay, India, visited WPI last summer while on a three-month trip around the world.

1952

Dick Bennett has been named a new account executive in the Palm Beach (FL) office of Richardson Greenshields Securities, the U.S. affiliate of one of Canada's largest brokerage firms. Following a career as a civil engineer working on pipeline and turnpike construction, Dick began as an investment professional in 1966. He spent five years with the Florida firm of Alan Bush.

1953

Currently, **George Crozier** serves as director of projects and vice president of Monsanto Enviro-Chem Systems and as president of Leonard Construction Company, both wholly owned subsidiaries of Monsanto. It was incorrectly reported in the August *Journal* that he was a vice president of Monsanto.

George Saltus has been elected to the board of trustees at WPI. He is a director at AT&T Information Systems Engineering for design and development at the company's Denver (CO) laboratory. He also serves as director of the Customer Switching Laboratory. With Bell since 1953, George has been involved with the design of switching systems, satellite control

and missile control systems. He holds seven patents on military computer circuits, electronic key telephone systems and Picturephone key telephone systems.

1954

Reunion May 31–June 3, 1984

Sahl Kabbani, a Saudi Arabian businessman, serves on the board of directors of a Muslim educational and religious organization, Dar al-Islam, located in Abiquiu, NM. The focal point of the 20-family colony is a mosque built of clay, mud, straw and adobe bricks, the only rural Muslim mosque in the U.S.

Following many years as president of his own firm, **Wesley Wheeler** has rejoined J.J. Henry Co., Inc., as vice president. The Henry organization is one of the world's largest firms of naval architects, marine engineers and consultants. Wheeler's most recent activities include preliminary design, plan approval, construction supervision, vessel operations and marine marketing.

1956

Robert Baer is president of M&M Services in Woodland, CO. He has his MBA from UCLA.

1958

Donald Abraham, a project engineer for Naval Underwater Systems Center in New London, CT, holds a patent on a volume reverberation profiler.

Richard Lisbon continues as director of planning at Virginia Commonwealth University in Richmond.

1959

Reunion May 31–June 3, 1984

MARRIED: Winthrop Wassenar and Kathy McNally on June 4, 1983. She is assistant professor of economics at Williams College, Williamstown, MA. Last year, he became director of the physical plant at Williams, where he's been employed for 18 years. Wassenar, who has a son and a daughter, likes golf, squash and gardening.

Bob Berg, president of Wesley Corporation, Scottdale, GA, writes that he is on three civic boards of directors. His daughter, Kimberly, graduated with high honors from WPI in June, after only three and a half years. His son, Eric, is now at Vanderbilt Graduate Divinity College.

Currently, **Dr. Dave Evensen** is head of a structural analysis section at Hughes Aircraft, El Segundo, CA. Daughter Karen is a computer scientist with Hughes in Irvine; son Craig is an electrical computer engineering major at UC, Santa Barbara; and Suzanne attends UC, Santa Cruz. His wife, Joanne, is a teacher. Last October Dave, who has taught at UCLA and USC, presented a national short course on "Applied

Structural Dynamics" in both the L.A. and Washington, DC, areas.

Bill Farnsworth continues as a plant superintendent with Du Pont in Victoria, TX. He writes, "Hobbies are golf, genealogy and raising three boys."

Kent Healy is now operating a one-man consulting office on Martha's Vineyard. He will continue developing prefabricated subsurface drains, on which he holds a joint patent with Mirafi, Inc. Previously he was a CE professor at the University of Connecticut for 19 years.

For the past four years, **Bob Hoag** has been manufacturing manager for Rosenthal Technik, Inc., Providence, RI. The product line includes technical ceramic packages and substrates for the electronics industry. The Hoags live in Attleboro, MA. and have two children. Bob says he's retired from any serious basketball but enjoys jogging and golf.

Tom Humphrey has been teaching, researching, writing and consulting with MIT's Center for Transportation Studies for nearly five years. One daughter just graduated from UMass; another graduated from the Fashion Institute of Technology in NYC and works for designer Ralph Lauren; and his son recently graduated from high school. The family likes to travel, ski and sail.

Larry Lavallee has started a new job as a principal engineer in the radar systems division of Raytheon's Equipment Development Labs in Wayland, MA. He and his family returned from Kwajalein Missile Range last summer, where

he had been a radar systems engineer with the RCA missile and surface radar division. He says they will miss island life, including scuba diving, sailing, karate, etc.

Last year, **Bob Massad** traveled to West Germany and Mexico City on business. "Actually I spend a lot of time traveling throughout the U.S. and Canada, too," he says. He has been a senior product engineer for Diamond Products, Bay State Abrasives (Dresser Industries) since 1968. He says he always travels with his golf shoes!

Win Priem serves as managing director of the National Financial Services Search Division, as well as senior officer of Korn/Ferry International, New York City. Prior to joining the firm in 1976, he was regional director of the U.S. Small Business Administration for the Northeast and had been vice president in the national division of Marine Midland Bank. He has an MBA from Babson and is an alumnus of the Program for Management Development at Harvard Business School.

Currently, **Bill Saimond** is manager of logistics operations for the orbiter fuel cell power plant group at the power systems division of UTC (formerly Pratt & Whitney Aircraft). From 1969 until 1973 he was a member of the Apollo launch team in Rockwell International's fuel cell/cryogenic group. He, his wife, Theresa, and three children reside on a three-acre gentleman's farm in Collinsville, CT.

Morgan Whitney runs the Lansdale (PA) plant that is building Ford Motor Company's

new vehicle video computer. EEC-IV, which has recently been featured in national advertising for the new Tempo, Topaz and Ranger. He is vice president of Ford Electronics and Refrigeration Corporation.

Geza Ziegler continues as director of manufacturing for Cognitronics Corp., Stamford, CT. Also, he is still vice president of the Long Ridge Volunteer Fire Co., as well as director of the Danbury branch of Bridgeport Engineering Institute. Besides freelance radio programming, he and his wife enjoy motorcycling. She is a development engineer at Norden Systems in Norwalk. Three of their four children are in college.

Frederick H. Lutze, Jr., Class Secretary

1960

Governor Michael Dukakis of Massachusetts has appointed **Martin Beck** to the Massachusetts Hazardous Waste Advisory Committee. Beck belongs to the ACS and the American Institute of Chemical Engineers. He has been employed in various chemical engineering capacities in the state, as well as in Paris, France and Pampa, TX.

George Beebe serves as a staff engineer at MIT Lincoln Laboratory in Lexington, MA.

1961

"**Rick**" Duval is president of U.S. Petrocol Industrial, Inc., in Lincoln, NE. He and his wife, Colleen, have five children.

Rimas Zinas was recently named technology program manager for control systems and energy in Bethlehem Steel Corporation's steel group. Zinas, who holds two ME degrees from WPI, joined the company in 1965 after two years with the U.S. Army. Originally with the research department, he was promoted to supervisor in 1971 and in 1982 was appointed supervisor of deformation processes and applied mechanics.

1962

Bruce Simmon holds the post of director of industry development at Computer Sciences Corp. in El Segundo, CA.

1963

Stephen Kaufman is the chief executive officer at Color Technology, Inc., Westboro, MA. He and his wife, Lois, have two children and live in Sharon.

1964

Reunion May 31-June 3, 1984

Charles Ennis, a professor at Thames Valley State Technical College in Connecticut, has been selected to teach *Electricity I*, the first

Burton: Cornell Engineering College Developer Retires

Last summer, Malcolm Burton, '40 ME, one of the foremost developers of the College of Engineering at Cornell University, retired as professor emeritus. He had been with the college for 37 years.

When Burton arrived at Cornell the Engineering Quad was the site of temporary barracks. "Olin Hall, where I first taught as a member of the chemical and metallurgical engineering faculty, was the only completed building of the projected modern engineering campus," he recalls.

He helped plan Bard Hall, built in 1963 to house what is now the Department of Materials Science and Engineering.

While with the college administration, Burton was head of the Division of Basic Studies. As associate dean of the college, he had special responsibility for academic affairs. He was also director of the Engineering Cooperative Program. Over the years, he shepherded the college and its students through successive changes in programs, adapting curricula to emerging needs.

His professional activities have included industrial consulting, and his publications include a textbook, *Applied Metallurgy for Engineers*.



Burton at Cornell

Burton, who holds his MS in metallurgy from MIT and taught there before going to Cornell in 1946, says of his retirement, "I want to continue to do things and look forward rather than back."

It is that spirit that has prompted Burton and his wife, Hazel, to move to a new home near their children in northern California. "I plan to build a house myself," he says.

course in an engineering-related area offered at Quinebaug Valley Community Center in Danielson. Ennis is a professional engineer and holds an MS degree from the University of Connecticut.

Carl Youngman of Newburyport, MA, has renovated his synagogue hall at his own expense as a tribute to his father, who died in July. A business consultant, Youngman is also an officer of the Doktor Pet Center Corp. and Command Performance. He graduated from Harvard Business School.

1965

Sidney Klein is vice president of sales and design for Lubin Business Interiors, Inc., New Haven, CT.

Gerald Morris has been elected a member of the board of directors of South Shore Bank. He is vice president-treasurer of the Foxboro (MA) Company. With Foxboro since 1981, he has his MBA from Harvard and is a member of the Financial Executives Institute, the Treasurers' Club of Boston and the Harvard C.S.A. Advisory Council.

1966

John Gilbert recently became quality manager of Pratt & Whitney's newest factory in Columbus, GA. He writes: "The factory will be an ultramodern facility with extensive robotics, computer controls and, we hope, a very forward-looking management." It will produce compressor airfoils and disk forgings from super alloys for company engines.

Dan Maguire has received his MBA from the University of Chicago.

Gerard Toupin has been named to the new position of director of manufacturing development of the Torrington Co. Cairo (GA) bearings plant. He had been plant manager since 1979 and joined Torrington in 1966 as a design engineer. He was instrumental in the planning and construction of the plant, guiding the onset of production as its first manufacturing manager.

1967

George Batten, Jr., executive director of West Essex Community Health Services, Inc., also serves as chairman of the board of the New Jersey Hospice Organization. George, who has a master's degree from Cornell, is a member and legislative chairman of the Home Health Agency Assembly of New Jersey. The West Caldwell civic leader is a tennis player, jogger, skier and white-water canoeist.

Joseph Cieplak, who has his MA in communications from Fairfield University, continues as director of marketing at Page-Wilson Corporation, Bridgeport, CT.

Michael Grilli holds the post of vice president at Beta Engineering, Inc., Pawtucket, RI.

Travenol Laboratories, Inc., has appointed **Nelson ("Skip") Thune** as vice president of manufacturing for its Hyland Therapeutics Division. With the firm for three and a half years,



"If a day is a week here, and a month is a day, and a year is an hour, how are they going to figure our pay?"

he was most recently director of manufacturing for the division.

1968

Wayne Blanchard continues as operations controller for Johnson & Johnson in New Brunswick, NJ. He has his MBA from Illinois Benedictine College, Lisle.

Victor Calabretta, Jr., was recently promoted to vice president of C.E. Maguire, Inc., international architects/engineers, in Providence, RI. He will direct marine and port activities for the company. Since joining Maguire 11 years ago, he has been concerned with domestic and international marine and port facilities, including a large ammunition port in Guam. A skilled diver, he has made numerous underwater condition surveys. He holds a BS and an MSCE from WPI and is a registered engineer in four New England states and Louisiana. Recognized for publishing six engineering papers, in 1979 he received the Geotechnical Group Award from the Boston Society of Civil Engineers.

Jeffrey Hultman is a counsel for Great Western Savings, Northridge, CA. He has a

law degree from Southwestern University, Los Angeles.

John Lunney serves as an electronics engineer with the Department of the Navy in Arlington, VA.

Richard Mayer is senior project manager for James River Corporation in South Hadley, MA. Currently, he is working on market development and business strategy for a new electrostatic film.

John Orciuch works as project manager at Digital Equipment Corp., Northboro, MA.

1969

Reunion

September 22, 1984

Robert Balcer is a planning consultant for ARCO. He resides in Dallas, TX.

Charles Doe has been elected an assistant vice president and associate actuary at State Mutual in Worcester. With the firm since 1969, he was promoted to actuary in 1979. In 1977, he was named a fellow of the Society of Actuaries. He has a master's degree from Northeastern.

Stephen Nagy, who has his MBA from Clark

University, is now a senior sales representative for Digital in Burlington, MA.

Jim Rodier, rate research manager for Public Service of New Hampshire, spoke on "Electrical Rates of PSNH" at the September meeting of the Cheshire Accountants Association in Keene.

Our apologies to **Steve Zuckerman**, who was listed as deceased in the 1982 edition of the *WPI Alumni Directory*. Steve is now a computer consultant for Prime Computer and resides in Brookline, MA.

1970

A. Patton Abbe serves as president of Hardwood Furniture Designs, Inc., in Pompano Beach, FL.

Richard Drolet is now manager of the systems department at Valley Resources, Inc., Cumberland, RI.

Randy Sablich recently left Grumman Aerospace and is currently employed as vice president and general manager of the electromechanical systems division at ABA Industries in Largo, FL.

John Sztuka is district sales manager for Hercules, Inc., Mobile, AL. He received his MBA from Western Michigan University.

1971

MARRIED: **John Niestemski** to Susan Bird in Syracuse, NY, on July 2, 1983. She graduated from Syracuse University and is president of Graphic Masters, Inc., Fayetteville. John holds degrees from WPI and the University of Bridgeport and works for Genigraphics Corp. of Liverpool.

BORN: to Barbara and **Doug Michel**, a daughter, Laura, on July 4, 1983. Brother Scott is now 3. Doug owns and operates Doug Michel Construction Co., Block Island, RI. He is also a commercial fisherman.

Michael Armenia is program manager for Raytheon Co., Portsmouth, RI. Also, he is a lieutenant commander and engineering duty officer in the U.S. Naval Reserve.

Dr. **Claude Mancel** continues as manager of product coordination of packaged soap and detergent products in Europe for Procter & Gamble. He and his family reside in Belgium.

Peter Markunas has been named the first director of public works in Provincetown, MA. Previously he was a mechanical engineer with the U.S. Department of Transportation.

Formerly director of market research at State Mutual, Worcester, **Robert Mills** was recently elected vice president and associate actuary at the firm.

Dr. **Noel Totti III** is a staff pneumologist at the VA Medical Center in San Juan, PR. He and his wife, Margarita, have three children.

1972

Thomas Ball holds the post of senior consultant at Bank of America in San Francisco.

Jim Hardy is now an optical engineer at Eastman Kodak in Rochester, NY. Jim's wife,

WPI's Own Marrying Sam!

Prof. Roger Borden, '61, of WPI's ME department, marries about 12 people each year. It's all perfectly legal, and his wife heartily approves. Prof. Borden, you see, is also an ordained Methodist minister.

"I've married several WPI students recently," he says, smiling. "Including Dick Coleman, '80 CS, and Kathryn Grider, '80 ME." Borden has also performed wedding ceremonies for Anita Draghetti and Leon Droby, '82 ME, and Jean Martin, '81, and Tom Daniels, '80 ME.

It is evident that Borden enjoys his students, whether he is teaching them or marrying them. He also counsels them. Currently chairman of the Committee on Student Advising, he says, "I believe student counseling should be one of the prime concerns on campus. These are difficult times for young people."

Borden has long been interested in counseling and in the pastoral ministry. Early on, he was a lay pastor for several churches in the Worcester area. Currently, he is part-time pastor for the East Templeton Church.

His area of professional expertise includes internal combustion engines, exhaust emissions and electric vehicles. Two years ago he was selected to participate in a year-long Department of Transportation program on Automotive Emissions and Economy in Cambridge.

Mary, works for the Visiting Nurse Service. They have two children, Jon and Luke.

Howard Levine is affiliated with the solar energy project at Texas Instruments in Dallas. In 1982 he received his PhD in physics from Rutgers.

1973

Ben Allen, who received his MS in ocean engineering from URI in 1982, is currently a senior engineer at Teledyne's Brewer Engineering Labs in Marion, MA.

Michael Gipps serves as senior production engineer at Dow Chemical Co., Pittsburg, CA.

Dr. **Gerald Izzi** is a physician in the department of internal medicine at the University of Cincinnati Medical Center. His MD is from George Washington University.

Richard Nabb now holds the position of plant manager at Clairol, Inc., in Camarillo, CA.

Michael Peterson has been named consumer services representative in North Adams by Massachusetts Electric Co. He has been with the utility since 1980. Before assuming his new duties, he was an analyst for New England Power Service Co., Westboro. He has an MBA from Anna Maria College.



Professor Roger Borden with the "Formula Racer Design," the MPQ of Martin Riccirelli, '83.

Borden and his wife, Connie, a secretary at Holy Cross, have a son, Andrew, '82 MGE, who is an industrial engineer at George Frost Company in Shirley, MA. Their daughter, Meredith, a junior at New England Conservatory of Music, performed as a singer-dancer at Busch Gardens in Williamsburg last summer.

Dr. **Stephen Szlatenyi**, who has his MD from Albany Medical College of Union University, is a physician at Rhode Island Hospital in Providence.

Angelo Tsefrekas was recently elected president of the George Jarvis Chapter No. 80 of the Order of Ahepa. He is president of Delta Associates Realty, Worcester.

Michael Varga is an engineering supervisor at Barden Corp., Danbury, CT.

Robert Zawada, associate actuary for Sun Life of Canada, Wellesley Hills, MA, has been designated a certified employee benefit specialist (CEBS) by the International Foundation of Employee Benefit Plans and the Wharton School of the University of Pennsylvania. He qualified for the designation by passing ten college-level national examinations on employee benefits subjects.

1974

Reunion

September 22, 1984

MARRIED: **John Palitsch** and Mary Beth Czubrynski in Worcester on May 29, 1983. A Becker graduate, she is a physical therapist at Worcester City Hospital. John is with Wyman-Gordon Co., North Grafton, MA.

BORN: to Mr. and Mrs. **Lawrence Martini** a son, **Mark Alan**, on May 22, 1983.

Dennis Rock, a musician and former audio faculty member of the Berklee School of Music, teaches a hands-on-course entitled *Recording Engineer Workshop* at MCM Recording/Video Services, Worcester's only professional recording studio.

Dean Stratouly is vice president of the Congress Group in Boston, MA. He has his MA in business management from Central Michigan University.

1975

MARRIED: **Mark Allen** and **Beth Ann Nygren** in New Britain, CT, on July 23, 1983. She graduated from Southern Connecticut State University with both a bachelor's and a master's degree and teaches at the Wheeler Clinic, Plainville. He is employed as a project manager for Morganti, Inc., Ridgefield. . . . **David Huff** and **Lisa Walters** in Cocoa Beach, FL, on September 16, 1983. Lisa graduated from the University of Georgia and is business manager of Cocoa Beach Broadcasting, Inc. David serves as a safety engineer with Eastern Space and Missile Center at Patrick AFB. . . . **Peter Joyce** to **Mary Beth McInerney** in Madison, CT, on September 3, 1983. She graduated from Albright College, Reading, PA. He owns Connecticut Suzuki in Wallingford, CT.

Currently, **Alan Bergstrom** is a staff biochemist for Merck, Sharp & Dohme Research Laboratories, the pharmaceutical research wing of Merck & Co. in Rahway, NJ. He, his wife, and two children reside in South Plainfield.

Richard Bloom, president of Independent Glass, has been selected for a three-year term on the board of directors of the Rhode Island Better Business Bureau in Providence. With the glass company since 1975, he was elected president in 1981.

Richard Caruso is now a process engineer at HRI, Inc., Gibbsboro, NJ.

Michael DiMascio continues as an associate in Firepro, Inc., Wellesley Hills, MA.

Denise Gorski, an industrial engineer for IBM, spent several weeks last spring in Japan at an IBM worldwide manufacturing review. On her return trip, she enjoyed a few days in Hawaii. Denise serves on the board of directors for her townhouse complex and takes evening courses.

The FIP Corporation has promoted **David Shopis** to vice president of construction. Formerly he was manager of project operations for the firm. He attended Virginia Polytechnic Institute and received an MS degree in building science from RPI.

Frank Sundermeyer is now vice president of engineering for Electronic Solutions, Inc., Watertown, CT.

Patricia Graham Flaherty, Class President

1976

MARRIED: **Brian Swanson** and **Ruth Rowan** in Grafton, MA, on August 27, 1983. Ruth graduated from Oberlin (OH) College and MIT and is a product manager at Norton Co., Worcester. Brian is a senior research engineer at

Norton. . . . **Steven Tuckerman** to **Dr. Krystyna DeLuca** in Brookline, MA, on August 20, 1983. She graduated from Liverpool University Medical School. He has a master's degree from UMass, Amherst, and is a town planner for East Hampton, CT. . . . **Thomas Zarrilli** and **Suzanne Kaminsky** in Philadelphia, PA, on October 1, 1983. Suzanne, a graduate of Moore College of Art, is import manager at Ellen Tracy, a women's sportswear company. Tom has his MBA from the Wharton School of the University of Pennsylvania and is vice president of Sonnenblick Goldman, a national real estate firm.

Norman Garipey has been elected a fellow of the Massachusetts Society of Certified Public Accountants, Inc. Currently he is in practice as principal with his office in Fitchburg, MA. He received an MS in accounting from Northeastern University.

Paul Grogan, who has his MS from Carnegie-Mellon University, is a teaching assistant at WPI.

Diane Gunn serves as construction engineer for the Smithsonian Institution in Washington, DC.

Formerly with Arthur Andersen, **Jim Hall** is now an associate in management systems support for Index Consulting.

Raymond Mandeville serves as a senior analysis engineer at ITT Grinnell Corp., Providence, RI.

Charles ("Rick") Robinson, senior quality engineer at Micro-Switch of Marlborough, MA, has been elected to the ESNE executive committee. He graduated with his BSEE from Tufts and his MS in management science from WPI. A certified quality engineer, he is a former treasurer of the Worcester section of the American Society for Quality Control.

Robert Roy IV is a project supervisor for GTE-Sylvania in Needham Heights, MA.

1977

MARRIED: **Richard Seidnitzer** and **Anita Lacapruca** in Springfield, MA, on September 23, 1983. Anita is a nutrition major at Holyoke Community College. Richard is a construction engineer.

In September, **Adolfo Chandeck** began a 12-month assignment at IBM's European marketing support center in Greenford, England.

Bill Cloutier is a senior engineer for Yankee Atomic in Framingham, MA. He and his wife, Ellen, have two children and reside in Hopkinton.

W. Paul Cullen is a partner in Applied Robotics, which celebrated its first birthday this January. The firm is located in Troy, NY, and designs "hands" and "brains" for robots used in manufacturing.

John Pappas, superintendent for Perini Corp. of Framingham, MA, writes, "Our current project is Harrah's Boardwalk Hotel and Casino in Atlantic City, NJ."

Robert Wyman, a project manager for Whitman & Howard's, Inc., Wellesley, MA, has been elected an assistant vice president of the consulting-engineering firm. He is responsible for water-system studies and long-range planning, the development of groundwater supplies and the design and supervision of water-main improvements. He has an MSCE from WPI.

1978

MARRIED: **David Balukonis** and **Cynthia Kittredge** on June 11, 1983, in Clinton, MA. A financial-assistance worker for the State Department of Public Welfare, Cynthia graduated from Worcester State and attended Southeastern Massachusetts University. David, who attended UMass as well as WPI, is assistant manager for Strand's Ski Shop, Worcester. . . . **Thomas Edwards** and **Mary Ann Matt** in Lee Center, NY, on September 10, 1983. Mary Ann is a student at Utica College of Syracuse University. Both she and Tom are employed by PAR Technology Corp., New Hartford, NY.

MARRIED: **Kevin McNamara** and **Mary Kruczynski** in Worcester on May 21, 1983. Mary graduated from Holy Name High School and is an administrative secretary at Shawmut Worcester County Bank. Kevin is employed as a mechanical engineer by Boston Edison Co.

. . . **James ("Demetri") Shuris** and **Kathleen Leone** in Marlborough, MA, on October 2, 1983. Kathy graduated from Framingham State College and is employed as an office manager at Medical Resources, Framingham, MA. Demetri is a construction project engineer at Riley Stoker Corporation, Worcester, and is a registered professional engineer in Massachusetts. . . . **Stephen Superson** and **Sharon Mulcahy** in Montville, CT, on October 8, 1983. Sharon graduated from Windham Dental Assistant School. Stephen is a design engineer at Tele-dyne Engineering Services Corp., Waltham, MA.

Raymond Beauvais, who has a BS in chemistry from Southeastern Massachusetts Technological Institute, is a teacher in Attleboro, MA. He and his wife, Sandra, have two children.

Wayne Beisecker, who is now with Ciba Geigy, Cranston, RI, is "glad to be back on the East Coast to pursue my favorite hobby, fishing." He and his wife, Kim, have two daughters, whose grandfather is **Bernard Beisecker**, '46.

Capt. **William Diederich** serves in acquisitions for the USAF at the Naval Systems Command in Arlington, VA.

Dr. Raymond Dunn is a surgery resident at the University of Massachusetts Medical Center in Worcester. He has his MD from Albany Medical College.

Mark Etre has been promoted to engineer at Northeast Utilities, Hartford, CT. He joined the firm in 1981 as an associate engineer. Currently, he is studying for his MSME at Hartford Graduate Center. The Etres have a son, Matthew, and a daughter, Kathryn.

Robert Flynn owns Bob Flynn Associates in Bloomfield, CT. He received his MBA from Babson.

John Holland is a senior engineer with Northern Research & Engineering, Woburn, MA.

Dr. Peter Johnson is a physician at Newton-Wellesley Hospital in Newton Lower Falls, MA. He received his MD from the University of Massachusetts Medical School.

Benjamin Khoudari serves as general manager of the family business in Bogota, Colombia. He and his wife, Jacqueline, have two children.

Osamu Kimura is a scheduling engineer for Fay, Spofford & Thorndike, Inc., Boston.

Gary Krumpholz is a staff member at MIT's

Lincoln Laboratory in Lexington, MA.

Francis Leahy III is studying for his MSEE at the University of California at Davis.

James Monroe serves as a research assistant at the University of Massachusetts Medical School in Worcester.

Sergej Ochrimenko continues as a field engineer for Raymond International, Rochelle Park, NJ.

Joseph Orlando is a senior engineer for Bunker Ramo in Trumbull, CT.

Bob Raslavsky is currently a self-employed photographer, photo-finisher and sales representative in Worcester.

Jeffrey Wetmore is a structural engineer at Edwards & Kelcey, Inc., Minneapolis, MN.

Randall Wyatt is a high voltage DC project engineer for GE in King of Prussia, PA.

1979

Reunion

September 22, 1984

MARRIED: **Martin Paglione** and **Lynn Stochaj** on May 7, 1983, in Worcester. Lynn graduated from Assumption College and is employed by Pronuptia de Paris Bridals. Martin, who holds degrees from WPI and UMass, Amherst, is a computer programmer analyst for Tile Composition, Inc., Chicopee, MA. . . .

Phillip Roux to **Karen Powell** on September 17, 1983, in New Britain, CT. A graduate of Southington High School, Karen is a secretary at the University of Connecticut Health Center in Farmington. Phillip works for Data General in Westboro, MA. . . . **Joseph Spinn** and **Lynda Mullen** on September 10, 1983. Lynda is a registered nurse. Spinn has been working

for the rocket performance group at Pratt & Whitney Aircraft in Florida. . . . **William Winters** and **Barbara Price** recently in Quincy, MA. She graduated from Quincy Junior College, and he is a civil engineer with the U.S. Geological Survey, Palo Alto, CA. He holds an MSCE from Cornell.

BORN: to **Sharon** and **Michael Gallerani** their first child, **Catherine Mary**, on June 13, 1983. Mike is a manufacturing specialist with the lighting systems department of GE. The Galleranis reside in Hendersonville, NC.

Stephen Falls is an R&D supervisor at the Spencer Turbine Co., Windsor, CT.

Eugenia Fernandez is currently attending the School of Management at Purdue University, where she is studying for a PhD in management information systems. She has received an IBM fellowship for the first year.

Scott Hansen has been promoted to senior engineer at Monsanto's Technical Center in Decatur, AL. With the firm since 1979, he is currently a member of the Acrilan research and development department. He is treasurer of the Decatur chapter of the AIChE and has served as an advisor for Junior Achievement.

Ronald Knapp is a senior design engineer with Advanced Micro Devices in Sunnysvale, CA.

Danny Lee works for Eastman Kodak in Rochester, NY.

Steven Mandell is a scientific programmer in the county engineer's office in West Palm Beach, FL.

Last May, **John Meader** received the "Young Engineer of the Year" award from the George Washington chapter of the Virginia Society of Professional Engineers, an affiliate of the National Society of Professional Engineers (NSPE).

Dan Pouliot is manager of switched services at New England Telephone in Burlington, VT.

Sandra Dorr Wilson serves as account system engineer for Information System Services-IBM in Waltham, MA. She was promoted from programmer/analyst to account system engineer last July.

1980

MARRIED: **Stephen Hansen** and **Maria De Los Angeles Wagner** in Nogales, AZ, on September 3, 1983. Maria graduated from Nogales High School. Stephen is employed at Chamberlain Manufacturing Corporation. . . . **Richard Hennessy** and **Karen Timmons** recently in Melrose, MA. A nurse at the Children's Hospital Medical Center, Boston. Karen received her BS in nursing from Boston College. Richard works for Brown and Sharpe Manufacturing Co., West Kingston, RI. . . . **Steven Kahn** to **Mary Donatelli** in Pittsburgh on August 25, 1983. Mary, a nurse in the intensive care unit at Montefiore Hospital, graduated from Duquesne University School of Nursing. Steve is with Westinghouse Bettis Laboratories, Pittsburgh. . . .

John O'Horo and **Kristine Scherzinger** recently in Clifton Park, NY. Kristine graduated from the University of Notre Dame and the GE Financial Management program. John is a management engineer at GE in Wisconsin.

MARRIED: **Mark Riley** and **Sharon Brierly** in Milford, NH, on October 8, 1983. She graduated from San Jose State University in San Jose, CA. They are both employed at Digital Equipment in Merrimack, NH. . . . **Edward Szkutak, Jr.**, and **Paula Mesite** on October 1, 1983, in Framingham, MA. They are both candidates for master's degrees: she from MIT and he from the University of North Carolina at Chapel Hill. . . . **Scott Yeomans** and **Rosemary DeForge** in Andover, CT, on October 8, 1983. She graduated from Bloomfield High School and is a secretary at the Travelers Insurance Co., Hartford, where he is a research analyst.

Douglas Armstrong, a researcher for Johnson & Johnson Orthopaedics in Braintree, MA, is concerned with materials and product research for implantable total-joint replacements.

David Aspinwall is a self-employed general contractor and builder in Millbury, MA.

Rex Chen works as a senior software engineer for Digital Equipment Corporation.

David Clarke is a part-time student at Bob Jones University and is also concerned part time with contracts for software development.

Donald Connor is a graduate student in the neurosciences at the University of Alabama in Birmingham. In 1982 he received his MS in neurochemistry from the University of Connecticut.

R. Barrie Etherington works as a process engineer for GE in Rutland, VT.

John Fazio is with Du Pont in Aiken, SC.

John Forrester, on temporary assignment in West Virginia since 1982, is an electrical field engineer for Stone & Webster in Boston.

Alan Freeman works for Fenwal, Inc., in Ashland, MA. He and his wife, Merilee, have one child.

Jim Getches is now with Triple-S Plastics in Kalamazoo, MI.

George Gikas is a project engineer for Aster Engineering Corp. in Middleton, MA. He has



"In the beginning, Biophase Genetics, Inc. created us."

his MS in metallurgy from the University of Connecticut.

Michael Kennedy now serves as a plant safety engineer for Conoco Chemicals Co. at the Chocolate Bayou plant near Alvin, TX.

Serge Molinari continues as a services engineer at Du Pont in Beaumont, TX.

Michael Ramadei is an electrical engineer for Philips Medical Systems, Inc., in Shelton, CT. Last year he received his MBA from Rivier College, Nashua, NH.

John Rust serves as a management trainee at Warren Pumps in Warren, MA. He holds a BA from Bridgewater State College.

Thomas Ryan, who has a master's in natural science and a BA in biology from Salem State College, is a teacher in the Wakefield (MA) public school system.

Paul Staehly is an associate engineer for Northeast Utilities in Middletown, CT.

William Taber works as a process engineer at Raytheon in Quincy, MA. He and his wife, Margaret, reside in Rockland.

Daniel Tarkiainen is a math teacher at Wachusett Regional High School in Holden, MA.

Lt. **Thomas Trepanier** serves as a reactor training officer with the U.S. Navy aboard the *USS Carolina*.

Scott Wade, who is currently working for his MBA at Drexel University, is an engineer with Philadelphia Electric Co.

Francis Walsh serves as a group leader in process engineering at W.R. Grace & Co., Lexington, MA.

1981

MARRIED: Wayne Barry to Sharon Eid on September 18, 1983, in Worcester. Sharon, a management trainee at Shawmut Worcester County Bank, graduated from Skidmore College. Wayne is employed by Largo Corp. and is studying for his master's degree at Assumption.

... **Daniel D'Amore** and Debra Souza in Clinton, MA, on June 25, 1983. A floral designer and graduate of Ritter School for Floral Design in Boston, Debra currently attends evening classes at Fitchburg State College. D'Amore teaches at Nashoba Regional High School.

... **Thomas Hryniewicz** to Lori Ann Chiasson in Worcester on September 10, 1983. A graduate of Assumption, Lori is studying for her master's degree at the University of Connecticut School of Social Work, West Hartford, CT. Tom is a demographic analyst and computer programmer for Donnelly Marketing Information Services, Stamford.

MARRIED: Kurt Ross and Darlene Butler on October 22, 1983, in Sudbury, MA. She graduated from Dean Junior College and is a senior secretary for Prime Computer, Framingham. He serves as an applications engineer with Applicon in Burlington.

... **Michael Schmerbeck** and Phyllis Rogers recently in Newton Centre, MA. Phyllis graduated from Saint Vincent Hospital School of Nursing, Worcester. A structural design engineer, Michael works for U.S. Steel in Pennsylvania. ... **James Thurber** and Kathy Signorielli in Norton, MA, on August 13, 1983. Kathy is a graduate of Assumption College.

Arthur Bainton is a test systems programmer at GenRad in Waltham, MA.

Ben Barber works as a design engineer at

Walking His Way To The Olympic Trials?

Brian Savilonis, '72, assistant professor of mechanical engineering at WPI, may well walk his way into the Olympic trials this year. He's got a good start. At 33, he's already a national-caliber race walker.

Last fall, he won his first ultra-distance race, the National 100 Kilometer Race-walking Championship in Arlington, VA. He topped a field of 25 in the 62.2-mile track race with a time of 10:33:12. Unofficially, this is the third fastest time ever by an American.

He also won the New England Championships at 30KM and placed second at 20KM and 5KM. He finished fifth at 50KM in the National Sports Festival at Colorado Springs last summer. In May, he placed 13th at the nationals in Monterey, CA, at 50KM.

Since taking up race walking seven years ago, Brian, formerly a dedicated runner, has not suffered a single injury, and rarely an ache or a pain. He became interested in the sport when he was a research scientist in Virginia.

Currently, race walking is popular mostly outside the U.S., with the stars coming from Mexico and Europe, but this does not deter Brian. "I have trouble finding someone to train with," he admits. "Sometimes I have to walk beside the slower runners."

He has made at least one dedicated convert: his wife. "Jan is a national certified race-walking judge," he reports. "But she doesn't show one bit of favoritism. She's given me more cautions than any other judge!"

Last year, Brian won a Teetor Award from the Society of Automotive Engineers for his technical work in the energy field. Previously, he was an assistant professor

Texas Instruments in Attleboro, MA.

David Briggs works for Codex Corporation, Mansfield, MA. He resides in Norwood.

Tony Cabral, who recently received his master's in metallurgy from Carnegie-Mellon, is now a metallurgical engineer at Pratt & Whitney Aircraft in East Hartford, CT.

Edward Crivello serves as a chemical engineer at the U.S. Army R&D Center in Natick, MA.

Eric Cunningham is currently engaged in developing a business to provide office space and prototype development services to engineers, technical sales representatives, architects and advertising firms. He is seeking partners in this venture, which will be located in the Boston area. The company name is Shared Resources, and the address is: P.O. Box #1381, Boston, MA 02205.

Dr. **Stephen Dellaporta** is currently working at Cold Spring Harbor (NY) Laboratory for the



Professor Brian Savilonis, '72 ME: A stroll to the L.A. Coliseum?

at the Center of Engineering, Widener College, Chester, PA, and a senior research scientist at the University of Virginia. He has an MSME from WPI and a PhD from SUNY-Buffalo.

Today, race walking takes up much of his "leisure" time. It's not an easy sport. It requires lots of upper-body strength and a technique that takes years to perfect. "People think it's a funny waddle. They don't appreciate the effort that goes into it. They think anyone can walk," Brian says.

True. Nearly everyone can walk, but few can walk like Brian Savilonis. And even fewer are saying they might have a shot at the Olympic trials.

1983 Nobel Prize winner in physiology and medicine, Dr. Barbara McClintock. She received the award for her work on transposable elements (jumping genes) in maize (corn). Through their efforts, ways may be found to genetically engineer corn to improve world food production.

Jeff Dick was recently named a senior electro-optic engineer in the engineering area of the Telecommunications Products Division of Corning Glass, Corning, NY.

John Farnsworth is a sanitary engineer with John A. Farnsworth in Lancaster, MA. Currently, he is a teaching assistant and full-time graduate student at WPI.

Thomas Finn is employed in the civil and marine division of C.E. Maguire, Inc., Providence, RI. He is also studying for his MBA at Bryant College.

James Geib now serves as a design engineer at Augat, Inc., Attleboro, MA.

Joseph Gionfriddo holds the post of manager at Procter & Gamble's Winton Hill Technical Center in Cincinnati, OH.

Gregory Glod is a professional development program associate with Colt Firearms in Hartford, CT.

Paul Goldense holds the post of assistant superintendent at Perini Corp., Cambridge, MA.

Richard Halleck was recently promoted to associate engineer at Northeast Utilities. He joined the firm in 1981 as an assistant engineer in the generation electrical engineering department.

Lee Hevey is now an applications engineer for Corning Glass Works Telecommunications Products Division, Corning, NY.

David Jensen serves as a B-52 pilot for the USAF at Andersen AFB, Guam.

Jeffrey Labuz, a graduate student in the EE department at the University of Virginia in Charlottesville, is working for his PhD and specializing in image processing.

Thomas Lepore has been promoted to senior vice president of Della Construction Co., Inc., Enfield, CT. Formerly a professor of civil engineering at the University of Hartford, he holds degrees from the University of Hartford College of Engineering and WPI. He joined Della in 1981 as vice president of engineering.

James Morgan is a computer scientist for

D&D Computer Security Center at Ft. Meade, MD.

Dennis Moulton works for Stone & Webster. He resides in New London, CT.

Dung Nguyen is manager of the plating department at Diamond Machining in Marlboro, MA. He has his MS from WPI.

Augustus Nunes, Jr., is a design engineer for Analog Devices, Inc., Norwood, MA.

Rick Rykosky currently works in design, project management and field supervising for the Gatx Terminals Corp. bulk liquid storage terminal in Good Hope, LA.

Chandran Santanam serves as a senior engineer at Riley Stoker Corp., Worcester.

Gilbert Stiles, Jr., holds the post of president at New England Test Systems, Westboro, MA.

Kristi Thompson, a chemistry teacher at Shepherd Regional High School, Dudley, MA, is working for her master's of education through UMass, Amherst.

Marc Trudeau is an acoustical engineer at Epicure Products, Inc., Newburyport, MA. He is studying for his MSEE at the University of Lowell.

David White is an electrical engineer at Combustion Engineering, Windsor, CT. Currently, he is studying for his MSEM at Western New England College.

1982

MARRIED: Robert Bean to Karen Rombosek on July 16, 1983, in Worcester. Karen is a senior at Worcester State College. Robert is a graduate student at WPI. . . . **Jane Bulejcik** and **Ralph Becker** in Webster, MA, on August 6, 1983. Jane is an electrical engineer with EVA Service Corp., Lincoln, RI. Ralph is a software engineer with Prime Computer, Framingham, MA. . . . **Brian Dunne** and **Mary-Ellen McLaughlin** in Worcester on June 26, 1983. Mary-Ellen graduated from Becker Junior College and Fitchburg State College. Brian works for Westinghouse Corp., Baltimore, MD. . . . **Robert Finnance** and **Beth Monde** on September 16, 1983, in Middletown, CT. Beth graduated from Endicott College. Robert, an engineer with GTE Corporation, Needham, MA, is also doing graduate work at Babson College. . . . **Gary Johnson** to **Jo-Ann Lane** in Reading, MA, on August 27, 1983. A registered nurse, she graduated from Peter Bent Brigham School of Nursing. He is a naval flight officer stationed in San Diego, CA.

MARRIED: David Leeman and **Carolyn Humfries** in Worcester on May 21, 1983. A medical secretary, she attended Quinsigamond Community College and Worcester State Col-

Living in Class!

Anyone who questions the value of the WPI Plan should talk with Paul Varadian, '75. Varadian, an honors graduate and recipient of the Carl F. Meyer Civil Engineering Award, is president of Trans-Continental Development Corp., a multimillion-dollar real-estate conglomerate based in Boston. One of Varadian's development projects has brought him back closer to WPI than he ever thought possible. Within 100 yards of Kaven Hall and across the street from the Worcester Art Museum, TransContinental has just finished converting Worcester's former North High School complex into a \$7-million luxury condominium development.

Varadian sees a direct link between his current ventures and the WPI Plan. "I was fortunate to have the opportunity to do one of the first large-scale MQPs on the construction of a major addition to the Burbank Hospital in Fitchburg, under the direction of Professor A. Fattah Chalabi. Now we've just finished developing one of the largest, private real estate projects undertaken in Worcester at the very doorstep of the WPI campus."

North High Gardens has been a national success story. Varadian structured an investment plan, now widely copied, by which an investment condo buyer could take advantage of a 25 percent investment tax credit, offered on certified historic rehabilitation projects, like North High Gardens. On a \$100,000 unit, a \$10,000 down payment, with a resulting \$25,000 tax



Paul Varadian in the atrium

credit, shows obvious appeal. A buyer then rents out the unit to meet the mortgage payments, with substantial profit coming upon sale five years later. And with a large four-story garden atrium, glass elevators, large units and ornate details, tenants truly "live in class."

Varadian is an active director of the WPI

Boston Alumni Association. He is also a founding director of the Summit Group, a well-known Boston financial and tax-planning firm, as well as a founding director of RETEC Associates, a real-estate consulting firm which serves Fortune 500 companies under the direction of another WPI alumnus, Peter Walworth, '74.

lege. He is with Hydronic Technology, Inc., Shrewsbury. . . . **Thomas Marnik** to Kathleen Correia in Fairhaven, MA, on September 17, 1983. A registered nurse, Kathleen graduated from Rhode Island College. Tom is a general contractor for Marnik's Construction. . . . **Cyril Marrion, Jr.**, and **Kathleen Pereira** were married on August 27, 1983, in Cumberland, RI. Kathleen is a mechanical engineer at Raytheon in Wayland, MA, and Marrion is an electrical engineer at Digital in Maynard. . . . **John Scoville** and **Christine Bruciati** in Middletown, CT, on September 10, 1983. Christine graduated from Becker. John is with GE in Cincinnati, OH. . . . **Scott Traynor** and **Leslie Cornwall** in Wethersfield, CT, on August 20, 1983. Leslie is a draftsman at Consultants and Designers, East Hartford. Scott is a mechanical engineer with Naval Underwater Systems Center, New London.

Gary Adams serves as a research assistant in the department of polymer science at the University of Massachusetts in Amherst.

Robert Addiss works for Transkinetics in Canton, MA.

Joyce Trela Auman was recently promoted to experimental engineer in the Hamilton Standard Division of United Technologies in Windsor Locks, CT.

Michael Bagley is a software engineer for Intelligent Business Systems in Saco, ME.

Alan Bardsley teaches physics in Seekonk, MA. He has a BS from Rhode Island College.

George Beauchesne is employed as a field engineer at Eaton Corp., AIL Division, Edwards, CA.

Dale Beaver serves as a design engineer at Innovative Products & Equipment in Lowell, MA.

John Bellantoni is a microwave component design engineer at Alpha Industries in Lawrence, MA.

Richard Bolstridge works as a software product specialist at Applicon, Inc., Burlington, MA.

David Carlson is a diagnostic programmer at Computervision Corp., Bedford, MA.

Paul Cottle is in the physics PhD program at Yale.

Donald Cowles, Jr., serves as a process engineer at GTE Sylvania in Needham, MA.

Brian Dalton works as a field engineer and assistant superintendent for Turner Construction Co. He is now located at Virginia Beach, VA.

Martin DeLuca is employed as a checker and supervisor at Pepsi-Cola New York Bottling, Long Island City, NY.

Harold Dickerman holds the post of product manager at Professional Software, Needham, MA.

Michael Donati is an applications engineer at Beswick Engineering Co., Inc., Ipswich, MA.

Toma Duhani works as a project engineer for the Department of Transportation in Providence, RI.

Matthew Flynn is a medicinal chemist at American Hoechst.

Ralph Gifford III is now a sales engineer for Dana Corp., Auburn, MA.

Jeff Gross has been promoted to products line engineer at the Hawthorne Farms facility of Intel Corp. in Hillsboro, OR. Previously he was with Intel in Chandler, AZ.

Stefan Hagopian is a full-time student at the

University of New England College of Osteopathic Medicine in Biddeford, ME.

Cheryl Hamer does research at Dana Farber Cancer Institute, Boston.

Daniel Head is a start-up nuclear engineer for Westinghouse in Fulton, MO. He and his wife, Xavier, have one child and live in Jefferson City.

Constance Heath is studying for her MBA at Clark University, Worcester.

Frederick Klich is employed as a design engineer at GE in Pittsfield, MA. Currently, he is studying for his master's in engineering at RPI.

Kevin Ladd works for Digital in Littleton, MA.

Ruth Lapan teaches chemistry at Rivier College, Nashua, NH. She has a BS from Trinity College, Burlington, VT, and an MEd from Keene State, Keene, NH.

Christopher Lord serves as an electrical design engineer at H.F. Henderson Industries, West Caldwell, NJ.

Richard Mallia is a programmer and instructor at Business Computer Systems, Newington, CT. He resides in Plainville.

Richard Masse is studying for his MSCE at UMass, Amherst.

John Mastroianni, who holds a BSEE from the University of New Haven and an associate's degree from Waterbury State Technical College, serves as a senior design engineer at Prime Computer, Inc., Framingham, MA.

Currently, **John McManus** is a process analyst for Pratt & Whitney Aircraft, East Hartford, CT.

Caryn Mee holds the post of research chemical engineer at the Army Materials and Mechanics Research Center in Watertown, MA.

Gary Oja is a systems programmer for AFI-Datrol, Hudson, MA.

Joel Patenaude is serving with the Peace Corps in Kenya.

Wilson Powell holds the post of manager of computer-aided design at Sunsearch, Inc., Guilford, CT.

Robert Raymond is plant manager at J.F. Donovan, Inc., Providence, RI. He and his wife, Ann, have two children.

Carl Rice works as a senior mechanical engineer for Gould's Modicon Division in Andover, MA.

David Rubinstein is a consultant at Arthur Andersen & Co., Boston.

Wayne Saari currently works as a software engineer at Bendix Grinding Machine in Worcester.

Peter Saloman is a software engineer at Wang Laboratories, Lowell, MA.

Kenneth Scott is chairman of the computer and business department at St. Peter-Marian High School in Worcester.

Douglas Sieber holds the post of plant engineer at Haartz Auto Fabric Company, Acton, MA.

Glen Stimson is an electrical engineer for Raytheon, Wayland, MA. He and his wife, Deborah, reside in Marlboro.

Christopher Trolle is a mechanical engineer intern at Omega Engineering, Stamford, CT.

1983

MARRIED: Stephen Beaudoin to Marsha Gallup in West Brewster, MA, on September

17, 1983. Marsha graduated from UConn and is a clinical dietician at Morton Hospital in Taunton. Stephen is with the U.S. Army Research and Development Laboratory in Natick.

. . . **Mark Boivin** and **Fern Amuan** on September 24, 1983, in Groton, CT. She is with the Naval Underwater Systems Center in New London and he serves as supervisor of chemical processes at Yardney's Battery Division in Pawcatuck. . . . **Sean Cafferty** and **Sharon Casson** on September 24, 1983, in Clinton, MA.

. . . **Donna Fitzback** and **Randy Becker** in Webster, MA, on June 25, 1983. Donna is a programmer at the Commerce Insurance Company in Webster. Randy is an accountant at Arthur Young and Company. Both graduated from Nichols College.

MARRIED: James Houskeeper to Lynn Blevins in Enfield, CT, on June 25, 1983. He is a mechanical engineer for United Oil Products in Bantam. . . . **Steven Kelley** and **Susan Knipe** in Shrewsbury, MA, on June 19, 1983. Susan, a calculation specialist for State Mutual in Dallas, TX, graduated from Quinsigamond Community College, Worcester. Steven is an electrical engineer with Texas Instruments, Dallas. . . . **Nelson Martel, Jr.**, and **Elaine Racicot** on August 13, 1983, in Agawam, MA. She attended UMass, Amherst. He works at IBM in Rochester, MN. . . . **William McMullan, Jr.**, to **Nancy Gallant** in Manchester, CT, on August 20, 1983. Nancy, who attended Our Lady of the Elms College, graduated from Worcester State College. McMullan is attending RPI's Center for Electric Power Engineering in Troy, NY. He has been employed as a transmission and distribution planning engineer at Commonwealth Electric Co. in Wareham.

MARRIED: Peter Mott, Jr., and **Stacey Bullock**, '82, on September 10, 1983, in Canton Center, CT. Peter is a software support specialist at Digital in Marlboro, MA. . . . **Richard Tolles** and **Nancy Ortman** in Middlebury, CT, on September 24, 1983. Nancy attended Worcester State College and was formerly with Shawmut Worcester County Bank. Richard is a computer engineer for MicroWare, Inc., of Kingston, MA. . . . **Kenneth Webber** and **Dale DeLiberio** on August 13, 1983, in Trumbull, CT. Dale is a programmer/analyst for Texas Instruments in Attleboro, MA, and Kenneth serves as a mechanical engineer at Digital Equipment Corp., Tewksbury. . . . **Nancy Wilkinson** and **Michael Lincoln** in Plainville, MA, on September 3, 1983. Nancy, a software engineer, is with Sanders Associates in Merrimack, NH. Michael graduated from King Philip Regional High School and is employed in the quality assurance department at Metaloy, Inc., Wrentham.

Sonia Adrianowycz has been employed by the Naval Electronic Systems Command in Washington, DC.

Patricia Allard is with GE-Medical in Milwaukee, WI.

Yuly Aronson is a junior engineer for the New York State Department of Transportation.

Donna Bagdonovich has joined Amicon Corporation in Lexington, MA.

Mark Besse works as a programmer at Harris Corp., Rochester, NY.

Ruth Bibbo has joined GE in Evendale, OH.

Joseph Boggio is now a field engineering representative with GE in Pittsfield, MA.

Robert Bors is with the Peace Corps in the Philippines.

Steven Burns works for Raytheon in Wayland, MA. He, his wife, Donna, and their child reside in Ashland.

Robert Bursiewicz is with Condiesel Mobile Equipment Corp., Schenectady, NY.

Renee Cardinal is a member of the technical staff at Hughes Aircraft Co. in Fullerton, CA.

Alan Carpenter serves as a civil engineering assistant for the County of Los Angeles in California.

Kevin Cavanaugh has joined the USN Underwater Systems Center, New London, CT, where he is an electronics engineer.

Edward Clancy works as a design engineer for GE in Wilmington, MA.

Dave Coleman is an associate software specialist at Digital Equipment Corp., Marlboro, MA.

Francis Connolly works for GTE in Westboro, MA.

Michael Connors is a manufacturing engineer at Torrington (CT) Co.

James Coyne is now an associate engineer at AVCO Systems Division in Wilmington, MA.

Gary Cromack of Greenfield, MA, is a self-employed consulting engineer.

Sujal Dave works as a software engineer for DEC in Andover, MA.

Richard Dietz works for Digital Equipment Co., Maynard, MA.

Peter DiMarco continues as a science teacher at Franklin (MA) High School.

Christopher Duggan is employed at GTE Products Corporation, Westboro, MA.

Jon Ericson holds the post of commander and team chief in the U.S. Army Signal Corps, Dugway, UT.

Currently, **Chris Erikson** attends graduate school at MIT.

James Flanders holds the post of production engineer at Photofabrication Engineering, Inc., Holliston, MA.

Dennis Foley is a manufacturing engineer at Texas Instruments in Attleboro, MA.

Peter Fontana has been named a member of the technical staff at Computervision in Bedford, MA.

Staff Sergeant **Brian Fuller** was recently selected to attend the U.S. Air Force Officer Training School near Lackland AFB, San Antonio, TX. After graduating as a second lieutenant, he will be assigned as a developmental engineer to Hanscom AFB, Bedford, MA.

Michael Gagnon serves as assistant sales engineer at Westinghouse Electric in Jericho, NY.

Jeffrey Giordano is now a career development engineer at Stone & Webster in Boston.

John Griffin has been named project engineer at Gillette in Boston, MA.

Janet Guerrin is currently working for her master's in biomedical engineering at Clemson University, where she is a graduate assistant. She lives in Central, SC.

Patrick Guida serves as a project engineer at Condiesel Mobile Equipment in Waterbury, CT.

Dr. **Robert Gundel**, who received his MBA from WPI last year, is manager of course-ware and media products at Data General Corp., Westboro, MA. He has a PhD, an MS and a BA from the University of Pennsylvania.

Stan Hargus is a senior engineer with DEC in Tewksbury, MA. He received his MS from WPI last year.

Steve Hight serves as a production supervisor at Procter & Gamble Manufacturing Co.,

Quincy, MA. Steve received the 1983 Charles T. Main Student Section Award for his leadership as chairman of the WPI student section of the ASME.

Yaron Hochman is a product test engineer at Analog Devices, Wilmington, MA.

John Howland holds the post of principal engineer at GenRad in Concord, MA. He also has degrees from Tulane and UConn.

Ronald Joy has been employed as a structural engineer at Andrews & Clark in Amherst, NH.

Mitchell Keamy, Jr., is now a junior civil engineer at General Services Administration in Boston.

John Kociecki serves as a senior engineer at Data General, Westboro, MA. He holds a BSEE from SUNY at Buffalo.

Robert Kodrzycki is doing graduate work in the department of botany at North Carolina State University. He is located in Raleigh.

Victor Kourey teaches in Leicester, MA.

Terese Kwiatkowski continues as a graduate student at Virginia Polytechnic & State University in Blacksburg.

Louis LaForce, who has degrees from St. Anselm College and Rivier College in New Hampshire, teaches at Triton Regional School in Byfield, MA.

William Lambert has joined Hamilton Standard in Windsor Locks, CT.

Nora Lane works for GE in Evendale, OH.

Allen LeBlanc has been named land surveyor and crew chief for Ewald Engineering Co. in Framingham, MA. He lives in Waltham.

John Letendre has been named an electronic engineer at Raytheon in Bedford, MA.

Karen Lombardo is a civil engineer with the New Jersey Department of Transportation in Newark.

William Lopes serves as a manager of utility and product design for GE in Fitchburg, MA.

John Mansour is with the department of physics at the University of Rochester in New York.

Robert Massaroni is a student at RPI, Troy, NY.

Nancy McLane has been employed as an environmental engineer at GTE Products Corp. in Needham, MA.

Brian McLaughlin is with Sage Laboratories, Inc., Natick, MA.

Scott Menard is an estimator for Robert E. McKee, Inc., Los Angeles, CA.

Ronald Merkel serves as manager of CAM systems at GE in Fitchburg, MA.

Keith Michaud is working for his MBA at Babson College, Babson Park, MA.

Mark Millay works as a mechanical engineer for GTE in Westboro, MA.

Mark Mungeam has been working as an estimator and field assistant for Moore Golf, Inc., of Culpeper, VA, a construction firm that builds golf courses and parks.

Digital has named **Stephen Munyan** a system programmer. He is located in Nashua, NH.

Dean Nahatis works for Andrews and Clarke, Inc., Engineering Consultants.

Jim Nesteruk is a manufacturing trainee for Harris Graphics in Dover, NH.

John Nicholson, Jr., works for Naval Electronic Systems in Arlington, VA, and resides in Falls Church.

Terence O'Coin serves as scientific programmer/analyst at Pratt & Whitney Aircraft in East Hartford, CT.

Lisa Orfan is a programmer/analyst with P.R. Donnelley & Sons in Old Saybrook, CT.

GTE has employed **Mark Padula** as a mechanical engineer at their facility in Westboro, MA.

David Palus works for Raytheon in Sudbury, MA.

Beth Papanou works for the video products division of GE in Portsmouth, VA.

Christopher Pappas is an applications engineer at Data Comm Systems, Inc., Framingham, MA.

Liza Paul, a teaching assistant at MIT, is in the PhD program in physical chemistry.

Aires Pavao works as a senior proposal engineer at Riley Stoker in Worcester. He has an associate engineering degree from Wentworth Institute and a BSME from SMU.

Philip Pearson is an associate programmer/analyst for Data General Corp. in Westboro, MA.

Michael Peszynski has joined Hamilton Standard in Windsor Locks, CT. He has an AS degree from Hartford State Technical College.

Nicholas Pirog serves as promotion and sales coordinator for Analagic in Danvers, MA.

Robert Plante serves as a senior analyst at New England Electric Systems in Westboro, MA.

Michael Quarrey is with the Resource Policy Center at Thayer School of Engineering, Dartmouth College, Hanover, NH.

International Medical Industries of Watertown, MA, has employed **Mark Robichaud** as an industrial engineer.

Ralph Rondinone, Jr., is now a metallurgical engineer at Digital Equipment Corp., Northboro, MA.

Anne Saunders has been named an electrical design engineer by Hamilton Standard in Windsor Locks, CT.

Thomas Shores has been named a mechanical design engineer by Raytheon of Bedford, MA.

Paul Skerker, a fellowship student, is studying for his master's degree at Cornell.

Steven Snyder is a junior member of the technical staff at ITT Avionics Division, Nutley, NJ.

Derek Speed works as a technical support specialist for Digital Equipment Corporation in Marlboro, MA.

Andy Steere is an associate engineer for NBI in Boulder, CO.

Lynn St. Germain and **Maureen Sexton** spent the summer in Europe. Maureen is an MIS consultant for Arthur Andersen & Co., Boston. Currently, Lynn is working for ITT in Shelton, CT. As the secretary of the Class of '83, Lynn requests that her classmates forward their current addresses to the Alumni Office so they won't miss the class mailings.

Neil Sullivan is a master's candidate in computer science at Duke University, Durham, NC.

Ronald Thompson, Jr., serves as a commercial credit analyst at United Bank of Denver in Colorado.

Michael Thorn has been named assistant scientist of quality assurance at Northeast Utilities in Berlin, CT.

Jennifer Toomey is with GE in Cincinnati.

John Vangos works as a quality engineer at Computervision in Bedford, MA.

Vinnie Vignaly is a civil engineer at Guerniere & Halnon, Milford, MA.

Robert Wadja is a manufacturing process engineer for Sprague Electric in Worcester.

David Ward is a senior principal software engineer at Honeywell in Phoenix, AZ.

Mary White works as a planning aide for the Town of Oxford, MA.

Stephen Wright has been employed as a mechanical design engineer at Kollmorgen Corp. in Northampton, MA.

School of Industrial Management

Bernie Olmsted, '58, recently retired as manager of plastics machinery engineering for Reed-Prentice Division of Package Machinery Company following 44 years of service. He now heads B.A. Olmsted & Associates, Inc., East Longmeadow, MA (plastic injection molding consultants). A registered professional engineer, Olmsted has been active with the Society of Plastics Engineers and is a past chairman of the Standards and Safety committees of the Society of the Plastics Industry's Injection Molding Machinery Section. . . . **Theresa Buckley, '77**, has been appointed personnel functional manager for the Maynard (MA) mill

complex of Digital Equipment Corporation. The position involves personnel administration responsibility for 4,000 employees in a 12-building complex through a staff of 35 personnel service administrators.

William Poist, '77, executive vice president of Commonwealth Gas Company, recently received the Albert J. Schwieger Award from WPI's School of Industrial Management. He joined the company in 1971 as a division manager in Cambridge. In 1978, he was named executive vice president. . . . **Irving Paton, '78**, works as a principal marketing specialist at Digital Equipment Corp., Merrimack, NH. He has a BS in computer systems from Daniel Webster College, Nashua. . . . **Remi Branconier, '82**, is currently the chief accountant for Worcester Controls Corp., West Boylston, MA.

Natural Science Program

Larry George, '78, has been named principal of the Guilford Central School in Vermont. Previously he was principal in Henniker, NH, and Amesbury, MA. He received a degree in history from Gordon College in 1967.

engineer at the Signal Corps Engineering Labs in Belmar, NJ. Before retiring in 1969, he was a civilian electronic engineer at Fort Monmouth for 29 years.

While at Fort Monmouth, he directed research relating to the application of radio and radar equipment for meteorological problems, as well as the instrumentation of the long-distance guided missile for Cape Canaveral in 1950. In World War II, he was responsible for the installation and operation of early-warning radar equipment on the West Coast. Also, he helped develop radar equipment in all three stages: spark gap transmitter, vacuum tube and solid state.

Mr. Gould had been an amateur radio operator since 1914 and a licensed amateur first class radio operator from 1919 until his death. He belonged to the American Radio Relay League, the National Audubon Society, the Antique Wireless Association and the Garden State Wireless Pioneers. He was a life member of the IEEE and belonged to the Veteran Wireless Operators Association, the Morse Telegraph Club and the Century Wireless Association (charter member).

Arthur W. Haley, '26, of Columbus, OH, died suddenly on August 28, 1983. An electrical engineering graduate, he was born on February 4, 1902, in Princeton, MA.

From graduation until his retirement in 1965, Mr. Haley was with Westinghouse Electric Corp., which he had served as a production supervisor, design engineer and section manager for refrigeration units. He belonged to Sigma Phi Epsilon, the Masons and the American Society of Heating, Refrigerating and Air Conditioning Engineers. He was a former vice president of the Connecticut Valley chapter of the Alumni Association.

Elmer Hansen, '26, the retired head of the electrical engineering section of the Pennsylvania Power & Light Co., Allentown, PA, died on August 18, 1983, at the age of 79. He was a native of Portland, ME.

After receiving his BSEE, he joined GE and was later employed by Iowa Electric Light & Power Co., W. R. Grace & Co., American & Foreign Power Corp. and Florida Power Corp. From 1948 until his retirement in 1969, he was with the Pennsylvania Power & Light Co. generating station in Allentown. Prior to being promoted to section head, he had been senior project engineer in the electrical engineering department. He belonged to the AIEE, the IRE and the Masons.

An avid cyclist, he often gave talks on bicycling. He was active in Congregational Church work for many years.

Walton P. Lewis, '28, a retired Navy commander and former president of the Worcester City Council, died July 23, 1983, in Laconia, NH. He was 77.

Initially a member of the Class of 1928, Mr. Lewis actually graduated with his BSEE in 1954. From 1930 until 1952, he was employed by American Steel & Wire, Worcester, where he served as an electrical cable engineer and consultant for defense projects. For 20 years he was an electronics engineer with the Navy, retiring in 1967. Other employers were RCA and Raytheon. He had retired from Eagles Mere Realty, Gilford, NH.

COMPLETED CAREERS

Joseph K. Schofield, '09, one of WPI's oldest living alumni, died in Hartford, CT, on September 27, 1983, at the age of 98. He was a native of Rockville, CT.

After graduating with his BSME, he attended National University (now Georgetown) and received his LLB in 1914. During his career, he was an assistant examiner in the U.S. Patent Office, Washington, DC, and assistant patent counsel for Ingersoll Rand, New York City. For more than 40 years he was a patent counsel for Pratt & Whitney in Hartford.

Mr. Schofield, who belonged to ATO, also was a member of the ABA, the Connecticut Bar Association and the American Patent Law Association. A former longtime consultant for the Smithsonian Institution, he was a member of the University Club, the Chemist Club (New York) and the Masons (32nd degree). For more than 50 years he belonged to the Hartford Choral Club and the Unitarian Church, both in Hartford. He was a former president of the Hartford and Washington (DC) chapters of the Alumni Association.

Howard P. King, '12, of Bloomfield, NJ, a retired patent lawyer, passed away recently. He was born in Washington, DC, on February 17, 1890.

After studying civil engineering at WPI, he entered New Jersey Law School, now Rutgers. He had been employed as a patent attorney by the U.S. Patent Office, Mason, Fenwick & Lawrence, DeForest Radio and Arcturus Radio Tube Co. In 1955 he retired from the patent department of Westinghouse in Bloomfield, NJ. For a time he was a self-employed patent lawyer and belonged to several patent law societies.

Helmer P. Johnson, '20, a former executive with Viko Shoe Co. of Worcester, died at his home in West Boylston, MA, on August 11, 1983. He was 86.

Born in Worcester, he graduated as a civil engineer from WPI. He was president and treasurer of Viko Shoe Co. for 44 years, prior to retiring in 1965. He had been a director of the Guaranty Bank and Trust Co., trustee of the Swedish Cemetery Corp. and superintendent of the Sunday School of Salem Covenant Church. He belonged to ATO and Sigma Xi. In World War I he served with the U.S. Army.

Aldo P. Greco, '23, of Lewisburg, PA, retired vice president of Champ Hats, Inc., died in July. He was born in Lavina, Italy, on July 29, 1900.

A graduate mechanical engineer, Mr. Greco had been employed by Simonds Saw & Steel Co., Woodward Wanger Co., Publicker Industries and Ace Mfg. Co., all in Philadelphia. The retired vice president in charge of production of Champ Hats, Sunbury, PA, he held a professional ME degree from WPI and an MBA from Harvard. He was a former president of the Philadelphia chapter of the Alumni Association, as well as an Alumni Council representative.

William B. Gould III, '25, a pioneer in electronics, died at Monmouth Medical Center in Long Branch, NJ, on August 15, 1983. He was 81.

After studying electrical engineering at WPI, he was later employed by WTAG in Worcester, Western Electric Co., RCA, the City of Boston and the (MA) Metropolitan District Commission. From 1940 to 1947 he was a senior radio

While in Worcester, he was a city councilman and president of the City Council. He belonged to the Aletheia Grotto, the Masons and various Republican clubs, as well as to the U.S. Naval Institute, the AIEE and ATO. He was a charter member of the Worcester chapter of De Molay.

N. Albert Anderson, '32, died at his home in East Dennis, MA, on July 20, 1983, at the age of 77. A Worcester native, he graduated as an electrical engineer from WPI.

From 1924 until 1928 he was a lab assistant in the WPI physics department. He was then with Norton Co., IBM and Sylvania Electric. He rejoined Norton in 1943. During his career with the company, he served as a machine electrical engineer with the machine division and as chief electrical engineer for the machine tool division, prior to his retirement in 1966.

Mr. Anderson, a former member of Central Congregational Church, Worcester, belonged to the AIEE and the electrical standards committee of the National Machine Tool Builders Association. He was a registered professional engineer in Massachusetts.

Raymond H. Lynch, '32, retired vice president for Ley Construction Co., died at his home in West Springfield, MA, on July 19, 1983. He was 72 and a native of Hopedale, MA.

He graduated as a civil engineer. During his career, his employers were J.G. Roy & Sons, Co., Fiske-Carter Co. and Ley Construction, from which he retired in 1975 as vice president. Until 1981 he was a consultant for Monsanto Co., Springfield.

A registered professional engineer, he belonged to PKT, Tau Beta Pi and Sigma Xi. He was a member of St. Thomas the Apostle Church, the Knights of Columbus and the Springfield Council of Retired Executives.

Emil C. Ostlund, '33, of Pocasset, MA, drowned when he fell overboard while lobstering off Wing's Neck. He was born in Brockton on June 10, 1911.

After graduating with his BSME, he joined U.S. Rubber Co. He then worked for American Steel & Wire Co., a division of U.S. Steel in Worcester. Later, as chief industrial engineer for U.S. Steel, he was transferred to Cleveland, then Pittsburgh. From 1966 until 1968, he served as a U.S. Steel consultant in Spain. He retired in 1969.

Mr. Ostlund belonged to ATO, Tau Beta Pi, the Society for Advancement of Management and the Cleveland Engineering Society. Active in alumni affairs, he had been president of the Cleveland chapter of the Alumni Association, captain for the Alumni Fund, chairman for the capital gifts campaign and a member of the Alumni Council. He was a professional engineer in Ohio and Massachusetts.

Dwight J. Dwinell, '34, a retired manager for GTE Sylvania, died in Newport, VT, on September 30, 1983, at the age of 71. He was a native of Orleans, VT, and a graduate mechanical engineer.

In 1973, he retired as manager of equipment design for GTE Sylvania, Inc., at the company's equipment development plant in Salem, MA. He had been with the company for 37 years. Assigned to the lighting division, he became chief engineer and held several patents.

Mr. Dwinell, a President's Advisory Council

member, belonged to the ASTM and the ASME and had been active in Congregational church work. He was a former vice president of the North Shore chapter of the Alumni Association and had worked for the Alumni Fund and for the Committee on Students.

Carl W. Larson, '40, a retired Navy lieutenant commander, died in Memorial Hospital in Worcester on July 19, 1983, at the age of 85.

A Worcester native, he held a BS from Northeastern and an MSME from WPI. From 1923 until 1941 he was an instructor in mechanical engineering at WPI. Also, he had taught at Purdue University and Ann Arbor State College.

He enlisted in the Navy in 1941 and became a lieutenant commander in 1942. During World War II, while serving with the Bureau of Ships, he received a citation from the Secretary of the Navy. He was a member of the Naval Reserves until 1963. Later he became a civil engineer in the assessor's office in Worcester, as well as at

In Remembrance and Tribute

Professor Richard V. ("Ollie") Olson, '54, Assistant Professor of Mathematics, died in August 1983. The recently established Richard V. Olson Memorial Award will be a cash prize given each year to a WPI sophomore who demonstrates outstanding performance in the Basic Mathematics Sequence.

The award is designed to recognize and honor Ollie's dedication to the education of WPI students. On the college faculty since 1962, he had developed close rapport with his students and maintained many friendships among alumni.

To endow this award, WPI has instituted the Richard V. Olson Memorial Fund. A faculty committee has been appointed to administer the Fund.

If you'd like to help in maintaining this worthy award, please write:

Sharon C. Davis
Alumni Office
Boynton Hall, 3rd Floor
Worcester Polytechnic Institute
Worcester, MA 01609

the Worcester County Electric Co., where he helped design a central steam generating plant.

Active with the Salem Covenant Church, he also belonged to the Reserve Officers of the United States, the Retired Officers Association, the Military Order of the World Wars and the Retired State, County & Municipal Employees Association of Massachusetts.

Dr. Robert L. Messier, '40, editor of *Chemical Abstracts*, Ohio State University, Columbus, died on August 14, 1983. He was born in

Worcester on Sept. 13, 1917, and was a graduate chemist.

He joined the magazine, which is a publication of the American Chemical Society, in 1945, after receiving his MS in food technology from the University of Massachusetts and his PhD in biochemistry from Cornell. He belonged to the ACS and the American Documentation Institute.

Francis J. Boyle, '41, a retired mechanical engineer from the Bendix Corp., passed away on September 22, 1983, in Wichita, KS, at the age of 64. He was a native of Saugus, MA.

During his career, Mr. Boyle was with Bryant Chucking Grinder Co., Matthews Mfg. Co., Lapointe Machine Tool Co. and Continental Screw Co. At the time of his retirement, he was a senior project engineer for Bendix in Kansas City, MO. He was a member of the Society of Automotive Engineers, the American Legion and the Elks. A retired USNR commander, in World War II he served in Alaska.

H. William Thatcher, '52, died in Savannah, GA, on August 25, 1983, at the age of 57. He was born in Milford, MA, and received his BSME from WPI.

At the time of his death, he was chief engineer of research and development at Hazlehurst (GA) Mills, a subsidiary of American Oil Corp. Previously, he worked for many years at the former Draper Corp. in Hopedale, MA, and at Molded Plastics Co. in Worcester.

He had belonged to the ASME, Sigma Alpha Epsilon, the Hopedale Country Club (charter member) and the Hazlehurst Country Club (board of directors).

Rodney C. Lewis, '76, formerly of Uxbridge, MA, died in August after being hit by a truck in North Carolina.

He received his BS in physics from WPI and later won a scholarship from MIT's Lincoln Laboratory in Lexington, MA, where he worked as a scientific programmer. Recently he was nominated for a doctorate in physics.

Capt. Brian S. Besser, '79, died in Jeddah, West Saudi Arabia, on September 2, 1983, while diving with a fellow Army officer in the Red Sea. He suffered an embolism while he was rescuing his companion whose tank had run out of oxygen.

He was born on May 5, 1957, in Providence, RI. In 1979 he graduated as a civil engineer. While with the ROTC at WPI, he was awarded the Cadet of the Year Award. The Army Meritorious Service Award has been given to his parents for his work in the construction of a military base in Saudi Arabia. Active with the Boy Scouts, he also held the Eagle Scout Award. He belonged to the Baptist Church and Zeta Psi.

Theresa A. Yeager, '81, died in Hartford, CT, on July 24, 1983. She was 24.

A native of Levittown, PA, she was born on Feb. 24, 1959. After studying at WPI, she graduated with a BS in engineering from Columbia University's School of Engineering. She had recently completed the master's program at the University of Pennsylvania in Philadelphia.

At the time of her death, she was with the engineering division of Pratt & Whitney in East Hartford, CT.



FEEDBACK

A Note to the Parents of WPI Students

We are pleased to announce that, beginning with this issue, you will receive the *Journal* with the compliments of the college. We hope it provides you with a closer look at, and a better understanding of, WPI. We'll welcome your comments.

Who's on First?

Editor: In 1954, Alan and I enrolled in WPI's Graduate Physics Program. This program was set up in the evening (a proud first for the Physics Department), enabling us to continue our education while working at the research lab of American Optical Company in Southbridge.

Alan and I completed all the require-

ments for the degree, and we received our M.S. degrees in Physics in June 1957. I was the first woman graduate of Worcester Polytechnic Institute.

As I recall, the only inconvenience (for me as a woman) was overcome by my carrying a "LADIES" sign to post over the rest rooms on the evenings I attended classes and had to use such facilities.

Audrey Michaels Carlan, '57 MSPH

As Judith Nitsch, '75, reported in her story on women at WPI (August 1983), Leslie Small Zorabedian, '72, was the first woman undergraduate at WPI.—Ed.

Counting on You

The August 1983 *Journal* presented a pot-

pourri of "Megameanings," Solomon Golomb's conversion table for scientific units, indicating a series of precise numerical relationships. Here are some additional Megameanings, submitted by a couple of our more, um, creative readers.

10⁶ microspheres = 2 hemispheres

10⁹ counters = 1 gigacounter

6 gongs = 1 hexagon

100 rabbits (hares) = 1 hectare

1 three-car collision = 1 trident

10⁶ bucks = 1 megabuck

—Walter Teal, '78

1/10 Amaz = 1 Deci Amaz

10⁹ babies = 1 giga gugu gaga

—Mark Lepkowski, '82

TRADITION



Photo: The Springfield Kilre Band

It's the heart of every Reunion Weekend.

Make plans now to renew friendships, rediscover WPI and take home more fond memories of your alma mater.

May 31-June 3, 1984

For the Classes of 1924, 1929, 1934, 1939, 1944, 1949, 1954, 1959 and 1964.
