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Robert F. Pinkerton, IM 1968, of Atlanta

- Native of Macon, followed father Frank Pinkerton, EE 1930, and uncle James Pinkerton, GE 1929, to Tech.
- Three years in Navy as a Supply Officer on a destroyer; two deployments to Vietnam.
- Retired after 31 years with UPS in the U.S. and Europe; responsible for worldwide acquisition and management of all automotive, facility, and real estate assets.
- Married 34 years to the former Christina Westfield of Decatur, Georgia, a retired Medical Social Worker (BA Journalism, University of Georgia; MEd, Georgia State University; MSW, University of Georgia); one son, Todd.

Gifts to Georgia Tech:
- Bequest provisions for the Alexander-Tharpe Fund and to fund a chair in supply chain management in the DuPree College of Management.

Notable Quotation:
"Christina and I believe that an adequate inheritance should be provided for family, but we strongly feel that wealth should be earned. We designated the bulk of our estate for charitable organizations where our gifts will make a real and lasting difference in lives of future generations. I can think of no better place than Georgia Tech to meet this goal."

Bob Pinkerton, IM 1968, is one of Founders' Council's 789 members who have made bequests or life income gifts of $25,000 or more in support of Georgia Tech's future.

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Warren Buffett
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Illustration by Bob Braun

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Women's Contributions Enrich Tech Experience

It was with pleasure that I read the last issue of the GEORGIA TECH ALUMNI MAGAZINE and its articles about 50 years of women on campus. The remarkable contributions of the women of Georgia Tech left a profound impression on me and I am sure on all other readers.

In meetings with groups in several of my national service roles, the topic of the downturn in enrollments in science and technology disciplines is one of the most commonly mentioned issues facing this nation. Close behind this comes the expression of concern that too few women are being attracted into such fields and professions.

The lost opportunity this nation feels because of this trend is illustrated by the accomplishments of Georgia Tech women. What if there were twice as many such creative and talented women working today? What inventions have not been developed and what new approaches to problems have gone undetected because the numbers are not as large as they might be?

While Georgia Tech is a national leader in educating women in engineering, our numbers should be greater. Many of those engaged in science and technology are working to improve this situation and we need to be a leader among them.

I was impressed by the number of firsts for women on campus, dating back to the graduation of Shirley Mewborn and Diane Michel as our first female engineering students. Each of those who are "firsts" have shown themselves to be eminently capable of doing their jobs. I am proud to have been involved to some extent in making some of the "firsts" happen and look forward to the day that all of the remaining barriers have been broken.

I say this not just because the goal is to hire a woman into a certain job, but because having female and male professionals working together as a team more often than not leads to a better result. Having women in visible leadership positions and as senior faculty establishes the role models needed to encourage other young female students to undertake careers in technology-related fields.

Our history so far has consisted of 50 years of women, and we all share in the pride of what has been achieved. However, there are many more years to come and it is in these times ahead that we should see the true flowering of seeds planted by the pioneers. It is the job of Georgia Tech to ensure there are no more lost opportunities.

Wayne Clough, CE 64, MS CE 65 President Georgia Institute of Technology

Thankful Reflections

Another year has ended. It's a time for reflection, a time to say thanks, a time for new hope.

We live in a remarkable world during incredible times. The pace of life seems faster than ever before. I don't think it's just the mileage on this middle-aged auto either. The demands on everyone today are greater than ever. Ask your kids or your grandkids and they'll tell you. Life may be faster, but it's infinitely more interesting.

The sheer knowledge that you can gain by being proactive about your life is astonishing. More now than ever you can appreciate the miracles of our environment, of science, of technology and yes, of the human spirit. It's stimulating.

We don't accomplish our role in the life of Georgia Tech without the help of many people. However briefly, I'd like to acknowledge them for their incredible support.

Thanks to President Wayne Clough and his wife Anne for their leadership.
Thanks to the faculty and staff of Georgia Tech for taking on the challenges of teaching, research and advancing the Institute.
Thanks to the students who define Tech for what it is today.
Thanks to the Georgia Tech Foundation for its support of the Alumni Association.
Thanks to the people who work at the Association for their passion, their commitment and their professionalism.
Thanks to the remarkable support of you, our alumni. Without you, this Association and the Institute would be only a shell of what it is and will be. I said it last year — many universities have more alumni, but none of them have more loyal alumni.

Thanks to my wife, Becky, my son, Kevin, and my daughter, Jennifer, for sharing their lives with me. It makes my life worthwhile.

Joseph P. Irwin
Vice President and Executive Director
Anne Marie Eaton, 95, attended Georgia Tech during World War II and again during the 1990s. Now her great-grandson, Chris Neiner, attends the Institute.

**War Era Women**

I attended Georgia Tech during World War II under the War Manpower Commission and took courses in industrial engineering. There were other women there too. As a matter of fact, we received certificates. When I enrolled at Georgia State to work on my master's degree, they accepted my certificate for credit. I received my master's from Georgia State in 1977. At that time, I was 70 years old.

I also went to Georgia Tech in the 1990s. My study is in the field of aging, and I took courses in the psychology department. My degrees are from Georgia State, but I have spent about four years at Georgia Tech.

We are a big Georgia Tech family. My late husband, Paul T. Eaton, was a professor in industrial engineering. I went to Georgia Tech, as did my two sons, Charles Eaton, ChE 56, of Greer, S.C., and Goetz Eaton, IM 58, of Anderson, S.C. My granddaughter worked there and my oldest great-grandson of my 25 great-grandchildren, Chris Neiner, is a student at Georgia Tech.

Some years ago, the funniest thing happened. I had my car repaired and when I went into the waiting room, there was a lady sitting there who looked familiar. We talked about where we could have met.

Finally I said, "Have you ever been at Georgia Tech?"

She said, "Oh yes, but that was so many years ago."

We had both attended Georgia Tech during the war years. So you shouldn't forget about us.

Anne Marie Eaton
Atlanta

**First Female Buzz**

I read the interesting series of mini-bios on various pioneering women at Tech, including the article on Susan Davis, the first female Buzz. I had the pleasure of serving as Buzz for two years while I was at Tech, and I was one of the incumbent Buzzes when she first got involved in the program.

I was one of two full-time Buzzes (with Mike Kluber, EE 87) from the spring of 1985 to spring 1986, then an alternate Buzz for a year from 1986 to 1987. I served again full time as one of two Buzzes (with Jeff Cunningham, EE 88), from 1987 to 1988, when Jeff and I both graduated.

Susan first tried out for Buzz at the start of that last timeframe and she was selected as an alternate Buzz at that time. In that capacity, she portrayed Buzz a number of times when Jeff and I both had conflicts. At the next year's tryouts, she became a full-time Buzz — the first female Buzz, and a good one.

James "Jim" Perrin, AE 88
Lafayette, Ind.

**First Women's Dorm**

I've enjoyed reading the various stories about the first 50 years of women students at Tech. Having been a student from 1963 to 1968, I'd like to note that, contrary to one article, there was a women's dorm before 1969. I only remember one female in my senior year major classes. She already had her MRS, so the rest of us were out of luck.

That same spring quarter, just north of Glenn Dorm, a new dormitory was opened that probably increased the growth of women at Tech — it featured air conditioning.

Robert Scott, IE 62
Dallas, Texas
Boyd Article Extreme

This is in response to the article in your Fall 2002 issue by Robert Coram titled “John Boyd — Architect of Modern Warfare.”

I graduated from the Fighter Weapons School at Nellis Air Force Base in 1953, and a number of my instructors were recent returnees from Korea. I subsequently was a combat-ready fighter pilot for 25 years, flying the F-100, F-89, F-84F and the RF4C.

John Boyd is well known in fighter pilot ranks as the originator of the concept of energy-maneuverability as it relates to fighter pilot tactics. But that basically is related to fighter versus fighter in gun engagements.

Modern day fighters are not gun platforms, they are weapons systems. This is why the statement that the F-4 was “foisted” on the Air Force was just not true.

In the early 1960s, the Air Force fighter inventory consisted of interceptors F-101B, F-102 and F-106 and fighters F-100, F-104 and F-105. The Air Force had no fighter either in development or in a competition for the fighter role.

The F-4H was designed to fulfill Navy requirements. The Navy believed that the day of the dog fight was over. Consequently, the F-4H was designed as an interceptor to defend the carrier task force and it only carried air-to-air missiles.

The Air Force wanted an all-purpose weapons platform. After receiving its F4Bs loaned from the Navy, the Air Force incorporated a number of changes and included a 20-millimeter Gatling gun installed in a pod on the aircraft centerline in the F-4D. This was followed by an internal gun in the nose of the F-4E.

Mr. Coram makes the statement that neither the F-4 nor F-105 performed well in Vietnam. Wrong. The F-105 was the primary fighter-bomber in the North and it delivered large payloads very effectively. In air-to-air, which was not its primary mission, it did reasonably well considering its disadvantages. In combat against the MiGs, it had to jettison its bombs in order to maneuver. Nevertheless, the 105s did score some gun kills.

The F-4s had more than a 2-to-1 kill advantage. Although the most effective engagement was to launch the missiles at a head-on target 12 miles out, the Pentagon mandated that all targets had to be positively identified visually, even if they had been tracked by our ground or airborne radar. By the time pilots had picked up the target visually and were able to identify it as a MiG, it was too close for the F-4H’s medium-range Sparrow weapon. This forced the F-4 to use a Sidewinder close-in missile or gun engagement, which was most advantageous to the MiG. Then the F-4s were restricted from pursuing the MiGs and shooting them down before they were in their landing pattern. In addition, the F-4 was designed to fly long distances, carry air-to-ground ordnance, meaning heavier structure, larger fuel tanks and more fuel. Its primary opponent, the MiG-21, had very short legs, and of course had a tremendous advantage of fighting in its own back yard close to its bases. The F-4 still beat them more than 2-to-1.

Comparing the Sabre, which I flew, to the MiG-15, these were both guns-only aircraft, and maneuverability, rate of dive and climb rate were all very important. But even more important was pilot skill and perception. The MiG-15 had a nasty tendency to spin out from a hard turn, an unrecoverable situation. The F-86 could be spun, but was very easy to recover. Thus the MiG pilot very likely had this in mind and was probably reluctant to fly to the edge of the envelope. Not so an F-86 pilot.

While Boyd is to be commended for identifying the interrelationship between energy and maneuverability and converting this into tactics of exchanging kinetic energy (speed) for potential energy by climbing (altitude) turns that expend less energy, a fighter aircraft today is far more than a dog fighter. It has to go much farther, stay longer and employ a varied suite of weapons.

Your article is far too subjective and simplistic. I simply hope that in the future you would be more objective and look for countervailing opinions. Statements like “Boyd is the greatest military theoretician since Sun Tzu” are pretty extreme. Better than Napoleon? Better than MacArthur? Please! As for Cheney throwing out Norman Schwarzkopf’s Desert Storm plan and substituting his own, I find that hard to believe.

Morton T. Eldridge
Colonel, U.S. Air Force (Retired)
Madison, Ala.

Robert Coram, author of the article and the book, “Boyd: The Fighter Pilot Who Changed the Art of War,” responds:

First, the Air Force did not want a Navy or “saltwater” airplane such as the F-4 and was humiliated when Secretary of Defense Robert McNamara foisted it on them. The colonel is wrong in saying the F-105 and F-4 performed well in Vietnam. The F-105 was so vulnerable that it required a fighter escort on its bombing missions. So many F-105 “Thuds” were shot down near Hanoi that the area was called “Thud Ridge.” And the F-4 was outclassed by the MiG except at high speed at low altitudes, which, by the way, is a discovery dictated by Boyd’s E-M Theory.

The colonel is also wrong about the 2-to-1 kill ratio he says the F-4 had over the MiG. The exchange ratio for a while
FppfiBack (1967) actually favored the North Vietnamese; by the end of the war it was at parity. The Air Force had one pilot who was an ace in Vietnam; the North Vietnamese had 16 aces. The embarrassing performance of the F-105 and the F-4 was the impetus behind the development of the F-15.

As for missile performance, the colonel is wrong. He says if the North Vietnamese had played by our rules of engagement that we could have won. Well, they didn't play by our rules. Radar missiles were so useless that many pilots punched them off the airplane as soon as they were away from their home base. And the Sidewinder missed so often it was called the "Sandwinder."

The colonel, like many Air Force officers, is aware of Boyd only as a pilot or as the developer of the E-M Theory and knows nothing of Boyd's famous briefing called "Patterns of Conflict." This briefing is an affirmation and updating of Sun Tzu and, most students of warfare would agree, ranges far beyond the strategic thinking of Napoleon or MacArthur. Finally, if the colonel doubts that Secretary of Defense Cheney threw out Gen. Schwarzkopf's initial war plan, he should interview Mr. Cheney. I did.

**True Military Hero**

I commend you for publishing the brilliant article (Fall 2002 ALUMNI MAGAZINE) on John Boyd, a true military leader and fellow Georgia Tech alumnus. I have studied Col. Boyd's theories over the last 12 years and their application in not only flying but more importantly in the pursuit of "doing the right thing" in my role as a leader of Marines. Col. Boyd represents a leader for all to aspire, not just military leaders. I dare say that if a majority of those serving our country in elected offices, as well as business leaders within "Corporate America," were to utilize his practices, this great nation would be even greater. As such, I look forward to reading Robert Coram's book on Col. Boyd.

On an editorial note, Gen. Krulak became the commandant of the Marine Corps in 1995, more than four years after the Gulf War ended.

Keep up the great work!

Brian Wright, Mgt 90
Major, U.S. Marine Corps
Cherry Point, N.C.

**Nuclear Disadvantage**

The nuclear energy article by Clinton Bastin in the Fall issue of the GEORGIA TECH ALUMNI MAGAZINE was interesting, and I defer to his 40 years of experience in the nuclear field. However, avid proponents of nuclear energy sometimes see things through rose-colored glasses. I know, because I felt the same way while working at the Atomic Energy Commission's National Reactor Testing Station from 1951 to 1965.

Unfortunately, the wonderful advantages of nuclear energy are seriously offset by worldwide disposal problems of highly radioactive, long-lived nuclear waste.

DuPont may have resolved some fuel reprocessing difficulties at the Savannah River Plant, but no one has found a fully safe solution to the disposal of radioactive debris. The Savannah River Plant has waste storage problems to this very day.

I often think how fortunate we are that the Atomic Energy Commission didn't decide 50 years ago to store nuclear waste in Mount St. Helens.

James W. Dykes
BE 45, ME 47, MS IM 48
Greer, S.C.

**We Want to Hear From You**

The ALUMNI MAGAZINE welcomes letters. Address all correspondence to: Georgia Tech Alumni Publications 190 North Ave., NW, Atlanta, GA 30313 Fax (404) 894-5113. E-mail: editor@alumni.gatech.edu (Please include full name, city and telephone number.)
Signature Step

Stride right up, lumber along — your gait is unique

John Wayne had a swagger. Marilyn Monroe had — well, you get the idea.

Everyone has a distinct walk that is as identifiable as a fingerprint or a signature, say Georgia Tech researchers, who are developing a technology that could identify you by your gait.

The technology could be used to help law enforcement find suspects or to identify terrorists by their manner of walking.

“We need technology to find the bad guys at a distance around federal buildings,” says Jon Geisheimer, a research engineer at the Georgia Tech Research Institute. “That was the original application. And after September 11, we began to see the usefulness of these technologies in airports.”

Tech uses radar guns in its work with the Defense Advanced Research Projects Agency to develop gait recognition. The system sends and receives a pulse of radar energy from signals reflected off objects. As a person walks, the radar signals change because of the “Doppler shift” effect.

Tech’s system can recognize and capture differing Doppler shifts during anyone’s natural walk. By recognizing patterns, the system creates a signature.

“We’re not seeing an image of the person,” says Gene Greneker, the principal research scientist. “We’re seeing the Doppler off those body parts and identifying what we’re looking at with the radar.”

Trailblazing Women

Elizabeth Herndon (left), one of the first two women to enroll at Georgia Tech, and Shirley Clements Mewborn, one of the first two women to graduate, receive a ride in the Ramblin’ Wreck as part of the festivities marking the 50th anniversary of women at Tech. The ceremony preceded the Tech-Florida State football game at Bobby Dodd Stadium on Nov. 9. Herndon was one of the first two women, along with Diane Michel, IE 56, admitted to Tech in 1952. Mewborn, EE 56, and Michel were the first two women to graduate from the Institute. In that 50-year period, Georgia Tech has become the No. 1 producer of female engineers in the country. A number of women who have achieved remarkable firsts and have contributed to Georgia Tech’s rich athletic tradition were also honored, including Paula McKenzie McCullers and Robin Reinhardt, players on the first women’s basketball team in 1974; Lisa Volmar, the first woman to drive the Ramblin’ Wreck in 1984; Susan Davis, who became the first female Buzz in 1987; and Wanda Nash Stidham, the first female Wreck Club president.

Pakistani student defends United States

Ehsan Ijaz, a 20-year-old junior at Georgia Tech and native of Islamabad, Pakistan, was featured in the New York Times in October as a defender of the United States on his home soil as he waits for his student visa to be renewed.

While critical of new security checks for Muslim males from 20 countries that have prevented him getting a visa, Ijaz “finds himself defending the United States these days, in increasingly heated conversations with other members of the country’s elite,” the paper said.

A computer science major, Ijaz wore flip-flops, shorts and a Yellow Jackets T-shirt during the interview. In October, residents of Islamabad, which has the wealthiest and most educated population in Pakistan, elected a candidate representing a coalition of religious parties determined to expel American forces from their country.

Ijaz says Pakistan is rife with rumors and incorrect information. Ijaz adds he has been told that the jets that struck the World Trade Center were flown by remote control or were part of an American or Israeli conspiracy to defame Islam. And Pakistanis don’t understand why America attacked Afghanistan.

The image of the United States is “terrible” in Pakistan, Ijaz told the Times.
Twenty-nine members of Georgia Tech's 1952 National Championship football team returned to campus Nov. 16 to celebrate the 50th anniversary of the "Golden Season." The undefeated Yellow Jackets — legendary Tech football coach Bobby Dodd said they were the best football team he ever coached — were voted national champions by the International News Service after a 24-7 rout of Ole Miss in the Sugar Bowl. Six players were voted to All-America teams and three were named to academic All-America teams. Team members and their families were honored at a dinner Friday night and watched the Tech-Duke football game from the President's Suite on Saturday. Among those attending the reunion are: (seated) trainer Buck Andel (first row) Ted Shuler, Chappell Rhino, Harry Wright, Joe Hall and Jake Shoemaker; (second row) Bill Sennett, John Vines, Bill Brigman, coach Sam Lyle, Ben Daugherty, George Morris, Bill Thaden, Jeff Knox, Robbie Robinson, Chick Wills, Ham Arnold, Frank Webster, Harry Goss and Hal Miller; (third row) Jerry Spratte, coach Jim Carlen, Paul Perry, Bill Banks, Matt Lyons, Dick Inman, Charlie Huff, Bob Bosoms and Rees Phenix.

Family Campaign

Florida Republican congressional candidate Katherine Harris campaigns with some help from two Georgia Tech alums — her brother, Walt Harris, IM 82, left, of Aspen, Colo., and her father, George W. Harris, IM 56, of Bartow, Fla. — on a street corner in Sarasota. Harris, who made national headlines two years ago as Florida's secretary of state during confusion over the ballot count in the presidential election, won the 13th Congressional District seat.
Father of The Pill
Carl Djerassi separates misconceptions about sex and reproduction

T
he day will come when sex and reproduction are separate."
So said Carl Djerassi during the 2002 Karlovitz Lecture, "Sex in the Age of Mechanical Reproduction," presented by the Georgia Tech College of Sciences on Oct. 30.

"When you talk about the separation of sex and reproduction people think it's terrible," Djerassi says, "but they are fooling themselves because the majority of people who have sex, most of the time, are not doing it for the purpose of reproduction.

"Every 24 hours there are 100 million acts of sexual intercourse performed in the world. From that number, there are about 1 million conceptions, roughly half of them unexpected," he says. "Half of that number are unwanted and there are 150,000 abortions, mostly illegal, performed every 24 hours. I would say most of those 100 million couples are interested in sex and not reproduction."

The beginning of the separation of sex and reproduction came in 1960, Djerassi says, with the introduction of oral contraceptives.

"This separated contraception from sex for the first time," he says. "The pill" was followed shortly thereafter by intrauterine devices.

"Before, if you wanted to prevent conception, someone had to stop and put on a condom or put in a diaphragm. All of that stopped with the oral contraceptive and it had a tremendous impact on sexual behavior."

The counterpart to sex without reproduction, reproduction without sex, was made possible in 1977 with the birth of the first baby created through in-vitro fertilization, the first "test tube baby."

"Since that time, over 1 million babies have been born in the world without sexual intercourse, and 1 million people have done this because one of the two in the couple was infertile or had infertility problems," Djerassi says. "The question becomes, 'Is it OK for an infertile person to demand of society or medicine to do something to enable them to become parents?' The vast majority would say, 'Sure, why not?' And that is why in-vitro fertilization was invented."

A recent development in assisted reproduction, Intra-Cytoplasmic Sperm Injection, in which a single sperm is used to fertilize an egg, has aroused new controversy over whether it will be used to create "designer babies."

"Since you need only one sperm to fertilize an egg and since the sex of the child is invariably controlled by the genetics of the sperm, if you can separate X and Y sperm — and you can, the technology was developed in animal husbandry — you can use ICSI to predict whether you have a male or female child," Djerassi says.

"Is that OK? Most people say, 'No, let God or nature determine that.' My answer is that we have been playing God for decades. We are willing to keep people alive under circumstances not determined by nature. We control genetic diseases that are easily diagnosed and which are associated with gender, such as hemophilia.

"If you have a number of embryos and you analyze them genetically and find that one carries Down syndrome and decide not to use it, why is that different at the embryonic stage than testing for Down syndrome at the fetal stage when abortion is the only option?"

"The argument becomes 'Is an embryo alive?' This is a fertilized egg that is two to three days old and there are thousands and thousands stored in the world right now. Is it a justified argument that they are alive? It is a scientific fact that 50 to 60 percent of fertilized eggs do not implant and the woman never knows she is pregnant. Why is that different?"
Enduring Vision

Ernest Welch shares his view of a lifetime

By Neil B. McGahee

It's a struggle for Ernest Welch to lift his 45-pound 8-by-10 view camera onto an equally cumbersome tripod. A slight-framed man, Welch literally disappears after he covers his head with the black focusing cloth. He has lugged the imposing camera all over Atlanta capturing serene images of gardens and flowers and lawns.

He hopes those images will be his legacy. The 96-year-old Atlantan, a 1928 graduate of Georgia Tech's School of Commerce, has taken photographs most of his life, but after retiring more than 30 years ago, it became his passion.

Last fall, Welch's work was presented in a retrospective exhibition of landscape and portrait photography at Georgia State University, where he earned a fine arts degree in 1999. The exhibit, titled "An Enduring Vision: Photographs by Ernest Welch," was made up of stark sepia images culled from nearly a lifetime.

Welch began taking pictures with an old Kodak while stationed as a counter-intelligence agent in Luxembourg and France in World War II. He wanted to show his family combat scenes and photos of his buddies.

Instead, Welch recorded beauty in the ruins of battle and hope in the war-weary eyes of civilians. Those photos made up a significant part of the exhibition.

The lead photograph in the Georgia State exhibit showed a young American soldier shaking hands with a very dapper civilian.

"That was me and Joseph Thiltges, an architect in Edelbrook, Luxembourg," Welch explains. "I was a member of the Counter Intelligence Corps, a little-known group sent into Europe a few days after significant Allied victories. Our job was to root out Nazi spies who had stayed behind when the Germans retreated.

"Joseph helped me greatly and we became good friends. He's 92 now, and we still correspond, although he's getting quite old."

Nineteen-year-old Marie Therese Wagner Scheuren posed next to her bicycle in a postwar Luxembourg street. Now in her 70s and a widow, she also remains in contact with Welch.

"I was fortunate to be in the CIC," Welch says. "The mainstream GI didn't have a lot of contact with the citizenry. Because I seldom wore a uniform, I was able to make a lot of good friends."

After the war, Welch made a career of sales and marketing with Sonoco Products, a global manufacturer of industrial and consumer packaging solutions, until he retired in 1971.

"I was constantly on the road with that job," Welch explains, "and wherever I went, I took a 35-millimeter camera. I was taking a lot of pictures but I realized I didn't know what I was doing. I admired Ansel Adams, so I began going to workshops put on by the Friends of Photography in Carmel,
California, in hopes of being able to attend one of his workshops.

"I applied eight times, and I was finally accepted just a month before he died. Ansel was old and wasn't actually teaching, but I was a guest in his home a couple of times."

Stimulated by the workshop experience, Welch enrolled in photography classes at Georgia State in 1990. Dubbed the "Atget of Springdale Drive" by his professors — a reference to Phillipe Atget, the diminutive French landscape photographer — Welch roamed his Druid Hills neighborhood searching for the spare, quiet images he prefers. Like many of his younger fellow students, he says he favors the big view camera over a small 35-mm camera.

"With a view camera, you really learn what photography is all about," he says. "And there's no comparison to the clarity of an 8x10 negative."

"I went back to school to learn," Welch says. "I hadn't really even considered earning a degree, but one day I realized I had so many photo courses, I might as well get one." GT
If you had put $10,000 into Berkshire Hathaway when Warren Buffett bought control of the company in 1965, you’d have more than $50 million today — compared to about $500,000 in Standard & Poor’s 500 stock index.

Buffett doesn’t make much fuss about his genius as the world’s greatest stock market investor.

“In this society, if you know how to allocate capital, you get paid very well. I have been lucky,” Buffett said during a 90-minute question-and-answer session with Georgia Tech students in the DuPree College of Management in October.

“My friend Bill Gates says I was born at just the right time and the right place,” Buffett says. “Referring to me, he said, ‘If you’d been born somewhere else a few thousand years ago, you’d have been some animal’s lunch.’ I can’t run very fast. I can’t climb trees.

“But I don’t need to run very fast or climb trees in this society. I just need to know how to allocate capital. Bill Gates would have been some animal’s lunch too. He can’t run that much faster than I can.”

Buffett’s legendary stature as a billionaire
investor is matched only by his legendary humility, wit and gentle humor.

The 72-year-old chairman and chief executive officer of Berkshire Hathaway invited students to give him their best shot, their toughest questions.

"Ask me anything — except what we're buying or selling," he urged the students. "Anything goes — business, personal, stock market."

The answers are not brief. He injects wit and humor, occasionally at his own expense, and he shares experiences, opinions and insights with folksy, plain-spoken sincerity.

Before fielding questions, Buffett gave the students a pep talk, encouraging them to make the most of the opportunities offered to them.

Everybody here is wired for success. You wouldn't be here unless you had a mind that will take you a long way. We look for three things when we're looking for people who work for Berkshire. We're looking for people with intelligence, which you've got, with energy, which I'm sure you've got, and with integrity. And we say if you don't have integrity, the other two will kill you, because if you've got someone who lacks integrity, you don't want them intelligent and energetic, you want them dumb and lazy. They're going to do you a lot of damage otherwise.

Integrity is something you make a decision on yourself. You see people out in the business world who make the wrong decisions. But it's totally what you elect to be. The time for thinking about that is now.

When I was 16, I just had two things on my mind — girls and cars. I wasn't very good with girls; therefore I thought about cars. I thought about girls too, but I had more luck with cars.

Let's say that when I turned 16 a genie appeared to me. And that genie said, "Warren, I'm going to give you the car of your choice — whatever you want. It'll be here tomorrow morning with a big ribbon tied around it. Brand new. And it's all yours."

Having heard the genie jokes, I would say, "What's the catch?" And the genie answers, "There's only one catch. It's the only car you're ever going to get in your life. It's got to last a lifetime."

If that had happened, I would have picked out that car and can you imagine, having it to last a lifetime, what I would do with it? I would have read the manual about five times. I would have kept it garaged at all times. If there was the least little dent or scratch, I'd have fixed it immediately because I wouldn't want it rusting. I would have babied that car because I would know that it would have to last a lifetime.

That's exactly the position you are in concerning your mind and body. You get one mind and one body. And it's got to last a lifetime. It's very easy to let the care of that ride for many years. But if you don't do the most with that mind and body, it'll be a wreck 40 years later, like the car would be. It's what you do now that determines how the mind and body function 10, 20 or 30 years from now.

You are doing the right thing with your mind by being here. You are taking that asset, the only one you will ever get, and you are maximizing it. And that is your No. 1 asset.

If you would give me 10 percent of your future earnings, I would pay any of you $50,000 cash right now. That means I'm saying you are worth $500,000 — 10 percent $50,000. That is a huge asset. It is more important than any other asset you have.

What you do with that — that $500,000 asset can become a many million dollar asset, or it could waste away — will be your choice.

What personal investing advice do you have for younger people?

Your best investment is yourself. There is nothing that compares to it. Until I got out of graduate school, I was terrified of public speaking. I would avoid classes where it was required. I couldn't do it. When I was at graduate school in New York, I signed up for a Dale Carnegie course. I gave them a $100 check. I stopped payment on it because I lost my nerve before I got there.

I went back to Omaha, I saw another ad, so I took $100 in cash with me. I went down to the hotel. I gave him the $100 because I knew if I gave him the 100 bucks it would force me to do it. And I did. I got in with about 25 other people who were as bad as I was. We all stood there and wouldn't talk to each other, basically.

But that $100, I invested in me. If I had never done that, if I spent the rest of my life terrified of public speaking, there is no telling what I would have missed out on, but it would have been huge.

Just think how that $100 has paid off. The investment I made in going to school has paid off. That was an investment not only of money, but energy and time. The best investment is yourself. Anything that makes you more effective as a human being is where to put your energy, and it may take a few dollars in certain cases.

Take on a tough job — taking on a sales job, for example. I think everybody ought to have some experience selling. You're going to have to sell in life, and nobody likes it at first.

I went to work selling when I was 20, when I got out of Columbia. I went out to Omaha and started selling stocks. I hated it. I could think of a dozen reasons as I walked down the street why they weren't going to buy from me. I looked about 12 at the time. I was emotionally about 8. It was a fabulous experience because I learned how to handle rejection.

You're going to be selling in your life at some point. Almost everyone is going to be selling one way or another, if nothing else, just selling somebody on getting married to you — truth in advertising on that one. Selling is an investment in yourself. Any investment you can make in yourself is terrific.

I also believe in investing of the traditional kind too. It's very important to get ahead of the game. It's so much better if you're dealing in strength from life than dealing from weakness. There's just no comparison.

I got married when I was 21, but I had saved about $9,800. I was never in the hole. I got 15 or 20 letters every day from people who are in trouble. There are two things that
cause it. Illness, in a great many cases — and I get some on gambling — but the biggest thing is people who have run up credit card debt. And they just get further and further behind. On a typical credit card you pay 18 percent interest.

I can't pay 18 percent interest and stay solvent. It's a crazy way to borrow, but it's easy and people get behind. You want to stay ahead of the game. Save a few bucks somehow so you're dealing from strength.

I believe in avoiding debt generally, but I particularly believe in avoiding credit card debt. It's so easy to incur, and it's so expensive. If you are willing to pay me 18 percent and you're good for it, we can do a lot of business.

I've never used much credit in my life. I always felt that if you were smart, you didn't need it, and if you were dumb, you had no business using it.

I would try to deal from strength. If you can save a few bucks and buy stock in a few businesses that you understand, it's a great time to be getting experience in it. And it is a good habit to develop.

I bought my first stock when I was 11. I don't know why I waited so long, I was interested much earlier. But it took me until I was 11 to get the 120 bucks to buy it. I bought three shares of Cities Service, preferred at 38. It went to 27 — you remember these things. My sister bought three shares with me. She couldn't stand the idea that I was going to get rich and she wasn't. We would walk to school and she kept reminding me as the stock went down. When it got back up to 40, I sold it. We each made $5 on our three shares. It went to 200 and something afterward. It doesn't pay to talk to your sister about your stocks on the way to school.

I understand you were a great admirer of Katherine Graham of The Washington Post. What should we learn from her management style and her leadership?

Katherine Graham wrote a Pulitzer Prize-winning autobiography about four or five years ago. It's the best autobiography I've ever read, and I've read hundreds of biographies and autobiographies.

"We're looking for people with intelligence, energy and integrity. And we say if you don't have integrity, the other two will kill you, because if you've got someone who lacks integrity, you don't want them intelligent and energetic. You want them dumb and lazy. They're going to do a lot of damage otherwise."

It's a fabulous story. She had one of the most interesting lives you can imagine. And it's absolutely true. I knew her very well. I recommend it to everybody here. It's an interesting story, but an educational story.

Katherine Graham grew up with a mother who belittled her all the time. She grew up in wealth, but absolutely no love from her mother, and no human wealth at all. She married a fellow who was absolutely brilliant, but who was a manic-depressive who committed suicide. While they were married, he also would make fun of her and tell her she was nothing.

All of a sudden, after the two most important people in her life telling her that she was worthless, in 1963 she took over one of the most important publishing operations in the world because she had this most important paper in the capital of the most important country in the world.

All the men around the place thought they were going to take the paper away from her. She had these huge feelings of inadequacy, even though she was a very smart woman, but she also had a strong will. Her father had bought that paper, and she was committed to what it stood for.

She practiced two hours in front of her four children just getting the lines out, just one or two lines, "I'm going to continue to run the place." She could hardly say it. She, by sheer will and plenty of intellect to go with it, went from a background of no business experience, no managerial experience, into running a company that became under her both an enormously successful media company and a hugely successful business enterprise. Berkshire bought in 1973 a block of Washington Post stock that cost us about $10 million. That stock today is worth $1.1 billion. It came mostly during her management.

Anytime you think that you can't do something, just pull out that book and read it. It's called "Personal History" by Katherine Graham.

You mentioned integrity — money is power and power corrupts. There are a lot of rich people who do really bad things.
I know people who have a lot of money and they get testimonial dinners and they get hospital wings named after them and do all kinds of things. And the truth is that nobody in the world loves them. If you get to my age in life and nobody thinks well of you, I don't care how big your bank account is, it's a disaster."

While stocks were going up. Now we are in a period where people are looking hard at what took place.

I'd say it's in the rinse cycle where you find out how dirty the laundry has been. We're in the rinse cycle of corporate America, and we're finding out that there was more dirty laundry than we care to admit.

Nobody cared when stocks were going up, and that's kind of the sad part.

I'd like to get your view on the situation in Iraq.

I think if there is reason to believe that a major country, such as Iraq, is developing nuclear, chemical or biological weapons — and it is reasonable to believe that they have evil intent toward you and may use them in some way — then I think it makes sense not to wait until they've got the full development of those kind of weapons.

You are always going to have some people with evil intent. Until 1945, the ability of any of those people to do mass damage was quite limited. Then we uncovered the secret of the atom.

Since that time, the ability to inflict damage by either a government that wishes to or a large terrorist organization has grown exponentially. The last 55 years have eclipsed all millenniums before.

I regard the threat from biological to be probably more imminent than nuclear simply because the materials are easier to come by. There are people in the world working on designer viruses that would wipe out millions of us. It's not a pleasant thought. It didn't exist 50 or 75 years ago, but it exists now.

We have to live with that reality. If we think that somebody is working on developing that, it is better to take action early than late, because late, they will have a gun to our head.

It's the tough question of mankind. But I would err on the side of making sure that the world understands we will deal with anybody trying to develop nuclear capabilities on the sly — early and in dramatic fashion.
What do you consider to be your greatest success and what do you consider to be your greatest failure?

In business, the scorecard is Berkshire Hathaway. I love what I'm doing, I tap-dance to work every morning. I have the best job in the world. I work with people I like — both within this small office that I have and in the business. I don’t get associated with people who make my stomach churn. That’s a luxury I have. That’s not a luxury you could have in every job.

If you work with people who cause your stomach to churn, I'd say get another job. That is a terrible way to go through life, and you only go through life once.

In terms of life, I'll give you an answer that may surprise you. Basically, when you get to my age, you'll really measure your success in life by how many of the people you want to have love you actually do love you.

I know people who have a lot of money and they get testimonial dinners and they get hospital wings named after them and do all kinds of things. And the truth is that nobody in the world loves them. If you get to my age in life and nobody thinks well of you, I don't care how big your bank account is, it's a disaster.

That's the ultimate test of how you have lived your life. The trouble with love is that basically you can't buy it. You can buy sex. You can buy testimonial dinners. You can buy pamphlets that say how wonderful you are. But the only way to get love is to be lovable.

It's very irritable if you have a lot of money. You’d like to think you could write a check. I’ll buy $1 million worth of love. But it doesn’t work that way. The more you give love away the more you get.

There’s an Oscar Hammerstein song, “Love in the heart isn’t put there to stay, love isn’t love until you give it away,” and basically, that’s what it is all about.

I’m so nuts about my business. Obviously I don’t need to do it for the money, so I do it because it’s what I’d rather do than anything in the world.

You’ll all do well enough financially. But imagine somebody getting a lot of money and having his kid not even like him. I see plenty of that. I see wealthy families where they all hate each other and they spend a lot of time hating each other. That’s pathetic. But you can’t change that by money.

There’s nobody in the family who can write a check and solve that kind of a problem. You only can do it by the way you live.

Ben Graham was a mentor to you. In the twilight of his life, he asked you to edit and revise “Intelligent Investor.” Then he rewrote what you wrote. How much do you differ from his philosophy?

Ben was one of my heroes in life. I have been extremely lucky. My heroes have never let me down. The natural heroes for you are your parents. If you [parents] let them down, you have, in effect, put a huge roadblock in the rest of their lives.

I went to school under Ben at Columbia University. I offered to go to work for him for nothing when I got out of school, and he said, “You’re overpriced.”

I would say the lessons that are in the book “Intelligent Investor” are responsible for whatever I have achieved. He gave me a framework for thinking. He taught me that a stock is a part of the business. It’s not something that wiggles around on charts that you can see going up and down on a screen. It’s a part of the business. You have to think about the business first and then decide what stocks to buy.

I had been fooling around with stocks for eight or nine years before I met Graham. I loved all this technical analysis and charting — all that sort of thing. I wasn’t making any money, but I was having a lot of fun. Then I read chapter 8 in “Intelligent Investor” and it said, “Just think of the stock as part of a business.” Value the business, then divide by the number of shares and it will tell you whether to buy or not.

He also had in that chapter talking about your attitude toward the market. Then chapter 20 was the margin of safety. If you think something is worth a dollar, don’t pay 99 cents for it. Buy it at 60 cents so there is a margin of safety. Don’t drive up to a bridge that says capacity 10,000 pounds with a 9,900-pound truck and drive across it. Go down the road and find one that says 20,000 pounds.

Those principles have done it all.

When he was in the hospital in 1971 or 1972, he asked me to do a revision. I wanted to expand on a lot of subjects like inflation and how to value a business. As soon as I started doing it, he did the same thing I would have done. “I’d rather write it my way.” It spurred him. It was very good for him in the hospital. I would have written what he wrote, I just would have added something to it. We didn’t disagree on the fundamentals at all.

He died in 1976. He was my hero. He did all kinds of things for me. He never expected anything in return.

How much do you think your company's charities contributed to your success in life?

Everything that I’ve got will go back to society — 99.8 or 99.9 percent will go back. I believe that should be the case. I’ve got a small group of trustees. I don’t believe in large groups running something like that. The majority, incidentally, are women. I picked people I trust and people whose judgment is very good.

I don’t direct them to do anything. I tell them that their judgment above ground is going to be better than my judgment 6 feet under. Just use this money for major social problems that do not have a natural funding constituency. I’m more worried about things that are important subjects that money really doesn’t flow to. A classic case would be what Rockefeller did early in the last century. There wasn’t a natural funding constituency for black education in the United States. So Rockefeller stepped in and did something that was an important social problem where there wasn’t any money.

I tell the foundation, “Don’t worry about failure because if you’re working on big, tough problems, you’re going to fail.”

I consider the No. 1 problem of the country and the
world is weapons of mass destruction. I just don’t know how to do much with money about it. But Ted Turner did set up this Nuclear Threat Initiative. His instincts are 100 percent right. Doing something about it is terribly difficult, but that’s why it’s a huge problem.

I admire my friend Bill Gates on that. Bill is spending about $1 billion a year from the foundation. He is measuring it by how many lives he is going to save every year. He reads thousands of pages on medicine every year. He wants his $1 billion to save the most lives possible in the world. He doesn’t care if they live in Seattle, he doesn’t care if they live in the United States. He just says wherever illness is wiping out lots of people and can be solved, that’s where he wants that money to go.

He doesn’t want his name on any buildings. He doesn’t want any publicity. And he does it with a very small staff. His wife, Melinda, and his dad are really the key people who work with him on this. His model is something that I admire.

What life principle did you go by?

To business success, I largely owe it to the fact that I was wired the right way and that I had a few great teachers — my dad and Ben Graham being the two best.

People are wired differently. You want to figure out what you are wired best for and then develop that talent quite dramatically. I was just lucky. I’ve worked at it, and I’ve had great teachers. I’ll give myself credit for 10 percent of it, or something like that.

Tiger Woods hits 400 or 500 balls a day. He was a natural to start with, but he’s worked like crazy to become as good as he is. But if I had worked just as hard, I wouldn’t go anywhere with it. I caddied for him about a year and half ago and, if I worked real hard, I’d still be caddying for him. He found something that he was absolutely sensational at, and then he worked and worked to hone that skill to be the very best.

He told me something that I found very interesting. He hits a minimal of 400 or 500 balls a day. He never hits a ball without having a target in mind.

You don’t want to take too much credit for your natural skill, but want to take credit for developing it.

Do you think corporations should be allowed to contribute to political campaigns?

It’s a terrible influence. I’ve written some op-ed pieces in terms of McCain-Feingold [campaign reform] and banning soft money. The truth is that the federal government is directing 20 percent of a $10 trillion gross domestic product. It is an entity like none other in the world, and they are setting the rules for everybody else. To have those subjected to the kind of influence that money can buy — and money can buy influence — is really bad news.

I got the first call for soft money in 1985. People didn’t even know what it was back then. And this senator kind of explained it to me. He was almost a little ashamed of himself. He was telling me how to get around the law. In 1997 the original law was passed that corporations couldn’t give money. And here was this guy in 1985 telling me how I can give unlimited amounts of money and the corporation can give unlimited amounts of money if I just do it a certain way. It’s not the way government should be. We’ve made some progress with McCain-Feingold, but it will take a lot of vigilance because a lot of people want money to buy influence. There is no question about it.

Can you tell us about your biggest failures?

If you’re talking about business failures, I’ve made all kinds of huge mistakes of omission. The ones of commission show up in accounting. If I buy something for $1 and sell it for 50 cents, it shows up. But if I don’t buy something for $1, and I know enough to buy it for $1 and it goes up to $100, it doesn’t show.

We’ve made relatively minor mistakes of commission. Those aren’t the ones that bother me. The acts of omission that I’m talking about are things within my circle of confidence, things I could understand, did understand and didn’t do anything about. I was sucking my thumb. Those are the big mistakes.

Four or five years ago, I set out to buy over 100 million shares of Wal-Mart that was selling at about 23. I bought about 5 million shares. But Wal-Mart was a cinch at those prices. But it went up a little bit and I quit buying. Now the cost of that — Wal-Mart split two-for-one — it’s 106 now. The cost of not following through was about $8 billion. Huge mistake. I’ve had a lot of them. We won’t go through the list or I’ll start crying.

What is your advice to up-and-coming entrepreneurs?

You gotta do what you love. You’ve got to have a passion for it. If you’re not doing it, get into something else. There is something out there for you. I am having absolutely as much fun now as when I started. It’s the game itself. As long as you are doing something that you enjoy, it doesn’t really make any difference whether you’ve got $10 million or $100 million or $1 million. You want to have enough so you can do most of the things in life you like doing. That doesn’t take a fortune.

You and I spend about seven hours a night sleeping. We’re sleeping on the same mattress. Seven hours of exact parity. I go to Dairy Queen, you go to McDonald’s — but (Berkshire) owns Dairy Queen. If we go to the Varsity, we get the same food. Our clothes aren’t different. I pay more for my clothes, but they look cheap when I put them on.

We both watch the Super Bowl on a big screen color television. If you don’t have one, you can go to a bar and watch it. We live in a place that is cool in summer and warm in winter. Almost everything we do is pretty much the same. I’ve got a lot of money, but in terms of how we live, that’s the only big difference. I drive a car — I drove a car that was 10 years old until about a year ago, but I had to listen to so much from so many people I told my daughter to go out and buy me another one. It doesn’t make any difference to me. I wouldn’t care what car I drove.
I travel better. When I came from Omaha to Atlanta, I traveled pretty nice. That's a big difference and it's costly, but that's about the only thing. You can enjoy life just as much as I'm enjoying it. And I enjoyed it as much when I was your age as I do now.

I was at Harvard one time and I said, basically, "Go to work for whomever you admire the most." And two weeks later I got a call from the dean and the dean said, "What did you tell those kids?"

I told them to work for whomever they admired the most.

He said, "That explains it. They're all becoming self-employed."

Don't think you're going to do this and that where you compromise your ideals or you compromise your beliefs or work with people you can't stand. Get right into something you enjoy.

If you don't want to jump out of bed in the morning for whatever you're doing, look for something else. Every day counts. It's like being in prison if you spend year after year at a job you don't like just because you think that someday you're going to be the boss or something.

Life is meant to be enjoyed day by day, and you'll be better anyway. You'll be more productive. You want to be developing yourself as you go along. And you'll feel good about yourself.

**How did you feel about "Buffetology"?**

There have been 26 books written on me. As long as they keep selling, people will keep writing them. By far the best investment-type biography is one that Larry Cunningham has written. What he has done is take everything from the annual reports and arrange them by topic. In terms of learning about business and investment, that's by far the best volume out there.

You'd really do better by reading "Intelligent Investor" by Ben Graham. That's where I've gotten my ideas.

"If I had been dropped into some other society, I wouldn't be anybody. I'm lucky enough to be in the right place at the right time. That's just plain luck. I had nothing to do with where I was born. I had nothing to do with the wiring here. I won the ovarian lottery, as this group has too. We're lucky."

**What advice would you give the Student Foundation Investment Committee, a student-run group?**

It depends on what your charter is. If the people who put the money in really want you to get experience investing in equities, you should invest in equities. They really want the students to get some first-hand experience in actual investing. I would try to make it as rich a learning experience as I could without blowing the whole thing.

**What is your philosophy about never splitting your stock?**

We've got an interesting philosophy at Berkshire. I consider it enormously important who our shareholders are. When we listed on the New York Stock Exchange, I said, "This listing will be a success if the stock never trades because I really want to have a bunch of shareholders who don't ever want to sell."

If I were forming a partnership and were going to pick 10 people in this room out and we were going to open a McDonald's or gas station, I'd want to pick 10 people who are in sync with me. So all my life I've started the partnership first. I started the partnership in 1956. I had seven people in that, and we had a dinner that night on May 5, 1956. I gave them a little thing about the ground rules. Here's how I'll judge myself. If you don't feel this way you shouldn't join, because I don't want you unhappy while I'm happy or vice versa. And when you have a marketable security like Berkshire, anybody can buy, there's no restrictions.

So how do I get people in who are going to be the kind of partners I want, long term, expect to hold it all their lives, not interested in quarterly results, all of these things that are the way I look at the business?

There are two ways to do it — by communication and by policies. If you look at Berkshire's report, you'll see 12 or 13 economic principles by which we govern the business. They are there to invite certain people in and to tell other people that this may not be a club you want to join. We don't want
“When we buy a stock, I want to be happy owning that stock if this afternoon they close the New York Stock Exchange for five years. And if I want the stock exchange to be open tomorrow, that means I care what the price of the stock is tomorrow.”

people coming in who have a different view.

Anybody can join, but if I were to open a restaurant and I say, “Hamburgers,” I’m going to get one group coming. If I say, “French food,” I’m going to get another group coming. There are big groups for both. If I deliver to those people what they expect when they come through the door, I’m going to have a happy clientele and a successful restaurant. But if they come through a hamburger door and they get French food, if they’re like me, they’re going to be disappointed. It’s very important, in my view, to communicate what we are and to have nothing inconsistent with that communication in what we do. But I want to talk to these people like they are my partners because they are my partners.

Berkshire has the lowest turnover of any stock on the New York Stock Exchange by a significant margin. Ninety-seven percent of our shareholders at the end of the year are the same people who were shareholders at the start of the year. That means that they are selecting themselves in terms of coming in the right way. They are not buying it because they think next quarter’s earnings are going to be up.

We never talk about earnings per share in the annual report. We never make a prediction. We don’t care. We don’t solicit analysts. We don’t want analysts; we want shareholders. We don’t solicit institutions because most of them have the wrong objectives.

Every policy we follow is consistent with that, and not splitting the stock is one. We don’t want anybody to buy it because it is going to split 100 for one. We don’t want people who look at it as a stock. We want people who look it as a business. It’s a business they own part of, they’re going to own it the rest of their lives. It won’t happen that way in many cases, but that’s their intent.

The way to get people to look at it as a business is not to behave with it like it’s just some stock out there. Basically we have people who are owners and partners. We’ve done that by that policy.

If somebody really thinks that the stock is more valuable because we’ve split it, they’re in the wrong show. It’s like the guy who went into the pizza parlor and said, “I’d like a pizza.” The guy says, “Shall I cut it into four pieces or eight?” And he says, “Better make it four, I couldn’t eat eight.”

What is your outlook on the economy?

We don’t think much about the economy. I’m going to be around as long as I’m going to be around. Think of it like a golf course. I’ll play every hole. Some are par 5s and some are par 3s. The important thing is how well I do relative to the par on the hole. On the long hole, I’m going to take more strokes, but if I keep playing the par or better, I’m going to have a good result in the end.

I don’t know how to predict the economy. I do know how to evaluate businesses. We look at them as businesses. When we buy a stock, I want to be happy owning that stock if this afternoon they close the New York Stock Exchange for five years. And if I want the stock exchange to be open tomorrow, that means I care what the price of the stock is tomorrow. I don’t care what the price of the stock is tomorrow. I don’t care what it is a year from now. I do care about how the business does. I judge our success by how the business does, and not how the stock does.

Coca-Cola was started in 1886. They went public in 1920. They went public at $40 a share. A year later it was $19 because sugar went up and bottlers were unhappy about some things.

Let’s say you were focusing on that as the short term. Just think of what you would have missed subsequently. Let’s say that you’ve seen the Great Depression coming, you’ve seen World War II coming, you’ve seen the atomic bomb coming, you’ve seen the Cold War coming. You can always have a reason to say, “Maybe this is the wrong time to be buying.”

The big thing is to be in the right companies and hold them for a long, long time. You’ve got to spend a lot of time thinking about the company. Don’t think much time thinking about the economy. GT
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TECHNOLOGY CHASES CURIOSITY

Imagination drives NASA Institute for Advanced Concepts

By Gary Goettling

The quest for fire occurred not because anyone knew what the practical uses for fire would be, but because it was fascinating.

That comment on mankind's relentless curiosity was made by the late cultural anthropologist Joseph Campbell, and it neatly summarizes the purpose of the NASA Institute for Advanced Concepts, according to Robert A. "Bob" Cassanova.

A 1975 Georgia Tech graduate with a PhD in aerospace engineering, Cassanova is the NIAC's director, a position he has held since its founding five years ago.

Initiated by the University Space Research Association, the NIAC's role as expressed in its charter is to assist NASA by identifying "grand, revolutionary concepts for architectures and systems" that will significantly affect the space agency's mission and stretch present-day notions about future possibilities.

In addition to its present activities, NASA is designing missions to undertake five to 10 years down the road — development of a hypersonic airplane and full deployment of the International Space Station, for instance. The NIAC looks 10 to 40 years further and supports development of innovative space-related concepts in areas such as propulsion, astronomy, earth science, robotics, biology and planetary colonization.

An interesting example of an NIAC-funded study originated at Georgia Tech, just a few blocks from Cassanova's Midtown Atlanta office.

Narayanan Komerath of the School of Aerospace Engineering submitted a proposal for "Tailored Force Fields for Space-Based Construction."

Komerath suggests that acoustical and electromagnetic fields can provide the work in an automated space-based construction system. Extracting material from asteroids and the lunar surface, these fields could then manipulate and shape the material into solid structures of virtually any size ranging from micrometer-scale fibers to human habitats a mile or more across.

"When you want to build large structures in space, it would be very expensive and awkward to carry everything up there prefabricated," Cassanova says. "What if you could use the material from asteroids to make habitats? Dr. Komerath is looking at ways of doing that."

It's pretty imaginative stuff, and though essential technological details are missing — from a nuts-and-bolts standpoint it's not easy to visualize how the system would work — the theory is compelling. But that's the point.

"We're looking for revolutionary ideas, grand concepts that are wonderful and majestic and could have a significant impact," Cassanova explains. "We're not interested in the next best widget or sensor or software program."

The fact that a particular idea can't be completely executed with existing technology isn't a drawback as far as Cassanova and the NIAC are concerned. Proposals must conform to the laws of physics and present credibility in terms of the basic science involved, but "the genius is in the generalities, not the details," he says.

Each fall the NIAC issues a call for proposals that attracts ideas from universities and businesses across the country. Following an extensive peer review of each submission, an NIAC panel meets to discuss the reviews and prioritize the concepts.

The list is submitted to NASA, which checks the proposals for appropriateness and makes sure none are already on the agency's to-do list or duplicate previous efforts. The NIAC picks the top 15 or 16 to receive a $75,000, six-month Phase 1 grant. The money allows the proposal's investigators time to study their concepts further and incorporate new information in a proposal for the second phase of the process.

The proposals received at this step are winnowed to the
NIAC's Life Finder project is proposed as a follow-up to the Terrestrial Planet Finder, which envisions segmented optical mirrors providing the first close-up look at planets outside our solar system. Life Finder will have a substantially greater light-collecting area.
The space elevator has captured the imagination of scientists and engineers. The device would be used to lift people and cargo into space.

top five or six and receive contracts of up to $500,000 over two years.

With Phase 2 funding, "researchers do a lot more detailed work on the concept," Cassanova says, "and we help lay the groundwork for follow-on funding directly from NASA.

"After Phase 2 we hand them over to NASA and say, 'Here are some good ideas we think you ought to pursue,' and hopefully they'll pick them up and carry them forward."

All things considered, it's not a lot of money, Cassanova adds. "We're offering enough money to excite the community and get people thinking about paradigm shifts and different ways of accomplishing things in the future in space and in aeronautics."

Of the 101 concepts funded by the NIAC to date, perhaps the one that has received the most publicity is the Entomopter ["Mars Invasion," TechNotes, GEORGIA TECH ALUMNI MAGAZINE, Spring 2002]. The creation of Rob Michelson, ECE 74, in the School of Aerospace Engineering, the Entomopter is a microrobot that flies by flapping its wings. The NIAC supported research into the device as a possible means for remote exploration of the Martian surface.

Fans of Sir Arthur C. Clarke's science fiction classic, "Fountains of Paradise," are familiar with the idea behind another NIAC-supported program, the space elevator.

In the proposed future-world version, the elevator would run along a vertical rail made of carbon nanotubes. One end of the rail is anchored to a platform in waters off the western coast of South America, at a place where the weather is relatively consistent. The other end is attached to a geosynchronous orbiter located about 60,000 miles from Earth.

The structure would be built by sending the orbiter, which houses a reel of flexible carbon nanotube ribbon, into low-Earth orbit. A free-electron laser located on the anchoring platform fires at the orbiter's energy-collection panel at just the right moment as it passes overhead, initiating a sequence of automatic responses. The orbiter fires ion thrusters to move past the geosynchronous orbit, then releases one end of the ribbon to begin snaking along the laser beam toward Earth. As the ribbon approaches its destination, the orbiter edges beyond its orbit to keep the structure's center of gravity in a geosynchronous position. Centrifugal force keeps the nanotube ribbon taut.

Once the first ribbon is secured to the platform, a robot climber with additional carbon nanotube begins its ascent up the narrow tether to the orbiter, laying another strip of the strong, lightweight ribbon as it goes. The climber remains aloft in the orbiter as a counterweight. Additional climbers follow, adding layer after layer until the ribbon is strong enough to safely handle a climber designed to lift people and cargo into space.

The space elevator has captured the imagination of the engineering and science public, Cassanova says. "This looks like it really could work. There are no serious showstoppers."

"Of course, there are details to be worked out," he notes. "You would have to work out a scheme so satellites in low-Earth orbit don't collide with the ribbon, and you'd be worried about micrometeorites hitting the ribbon. Those possibilities and more are being studied, and that's what we're here for — to help researchers lay out exciting new concepts and a plan for the enabling technology."

A number of NIAC-funded concepts deal with propulsion. Among the first to earn support was an idea for a system employing a plasma bubble.

It would work something like this: A plasma is created and subjected to a magnetic field, which inflates the plasma into a bubble — it's actually two tangent lobes rather than a sphere — several miles in diameter. The charged particles in solar wind collide with the gas plasma, and the force of that interaction is transferred via the magnetic field lines to produce thrust for whatever kind of vehicle is attached to the plasma generator.

Tests at NASA's Marshall Space Flight Center indicate the concept holds considerable merit, according to Cassanova.

"This is a fascinating idea that has significant possibilities
for space flight in the future," he says. "This would replace the need for solar sails and actually be much simpler because it really has no moving parts. Solar sails — giant umbrella-like devices to catch the solar wind — would be a mechanical monstrosity to try to unfurl and very cumbersome to steer."

The plasma bubble, on the other hand, would be easy to steer, he says. "Because the shape of the bubble is not symmetrical, you could rotate it, change its orientation relative to the vehicle, and tack through space like a sail tacks in the wind on Earth."

The edges of the universe will come a lot closer to Earth if any of the astronomy concepts identified by the NIAC are realized in the coming decades. A project dubbed "Life Finder" envisions segmented optical mirrors each 200 feet or more in diameter orbiting through space in arrays that could stretch over several miles. The lightweight mirrors would reflect images to secondary and tertiary collectors, and finally to an image plane, according to Cassanova.

Researchers received NIAC support to address some of the issues involved, particularly those related to formation flying in space and surface-error correction for the huge mirrors. The mirrors could be stationed at Lagrange points, which are specific, relatively stable locations in space, Cassanova says. A number of Lagrange points have been identified between Earth and the moon and at other places in the solar system.

If the idea works, "it could provide the first close-up look at planets outside our solar system," he notes.

An orbiting-array approach is also behind an NIAC-supported investigation into a telescope that employs X-ray interferometry. Because of the short wavelength of X-rays, interferometric baselines can be much shorter and more practical than systems relying on the visible wavelengths. Proponents claim the sensitivity of an X-ray telescope is so high it could detect details of galactic objects such as black holes in the center of our galaxy.

Cassanova spends much of his time traveling around the country talking to groups about the NIAC and describing some of the innovative concepts that have come across his desk over the past five years. His comments are punctuated with quotations from science fiction writers, with good reason.

"Lots of scientists and engineers at Georgia Tech have been reading science fiction most of their reading lives and have been influenced and inspired by it," he explains. "We're
NIAC director Bob Cassanova does not believe in stifling the imagination.
trying to get people thinking well beyond where they are now — not into the realm of pure science fiction, but looking at the inspiration of science fiction may foretell what can be done in the future."

Cassanova has long been intrigued by the interplay between art and science, which he believes have a common basis even if their ultimate expressions are different.

"I’ve been trying to understand the process of creative thinking to figure out where are the big thinkers, the revolutionary thinkers, that the NIAC should try to tap into," he continues. "If you look back at the lives of revolutionary artists and scientists, you’ll see they often described ‘explosions’ of creativity.

"On the other hand, there’s also a process like probing around looking for things in the fog, and quite often your subconscious and intuition play a big role in making discoveries. You’ll start thinking about something and you may think about it for years, then all of a sudden an idea springs forth in an explosion of creativity. Einstein described that feeling relative to some of the things he did.

"Great concepts that trigger paradigm changes are simple, elegant, majestic and often express symmetry and order," Cassanova says, citing as examples Darwin’s Theory of Evolution, plate tectonics, Einstein’s Theory of Relativity and the emerging "super-string" unifying theory in physics.

He completes his thought by retrieving a framed black-and-white photograph from the wall. It’s a bottom-up view of the spiral staircase at the Sappelo Island lighthouse.

"What caught my eye about this image and what makes it aesthetically pleasing is its expression of symmetry and order," explains Cassanova, an accomplished amateur photographer. "Art and physics are both about organizing perceptions. They share the desire to investigate the ways the interlocking pieces of reality fit together."

Cassanova joined the NIAC following a 30-year career at Georgia Tech — and a retirement period shorter than most people’s summer vacations.

An aerospace engineering graduate of North Carolina State University, Cassanova found himself working in rarefied gas dynamics for Arnold Engineering Development Center in Tullahoma, Tenn., while finishing his master’s in aerospace engineering at the University of Tennessee in the late 1960s.

Georgia Tech was interested in building a rarefied gas dynamics lab for its aerospace school. Cassanova got the call.

"I moved down to Georgia Tech and built the lab," he says, "and also ended up working with a number of really exciting and fascinating faculty members like Ben Zinn and Don Giddens."

Following his PhD work at Tech, Cassanova wanted to remain on North Avenue as a full-time researcher, so he joined what was then called the Engineering Experiment Station, later renamed the Georgia Tech Research Institute. After spending several years working on solar thermal engines and other projects, he gravitated back to aerospace.

Cassanova became the first director of GTRI’s Aerospace Laboratory, a post he held for 10 years until retiring in 1998.

"I had been working with the University Space Research Association as a member of their board of trustees," he recalls. "They heard I was retiring and asked if I’d be interested in becoming director of this new institute they were proposing to NASA. I said, ‘Sure, it sounds like fun.’ And 10 days after I retired from GTRI, I was back at work at NIAC — and I’ve been having fun ever since."

Additional information about the NIAC is available at its Web site, www.niac.usra.edu.
Today's houses are solarized, computerized, robotized — and sometimes underground
A house is a living machine." So said the French architect Le Corbusier, who died in 1965. His quote seems more appropriate for the 21st century. Technology has changed the way we build our homes and how we live in them.

Soon your house may clean itself and your refrigerator may tell you to pick up milk. Someday you may be able to communicate with visitors at your front door — when you are miles away. You also could monitor what's going on inside the house, even though you know your kids would never dare throw a party.

In houses of tomorrow, computerized closets that pick out our clothes according to the weather forecast, lights that switch on when someone enters a room and a single machine that washes clothes, then dries them may be commonplace.

At Georgia Tech, the 5,000-square-foot Aware Home is equipped with the latest gadgets. A computer application — What Was I Cooking? — makes sure the cook hasn't missed any ingredients or added chili powder when he meant to add salt. Perhaps in the near future robotic chefs will be preparing our meals.

Elsewhere researchers are at work on a "nursebot" that could help senior citizens remain in their own homes.

The robotic nurse could do everything from opening jars to monitoring the human resident's vital signs. This robotic companion is expected to be available in about five years at a cost of somewhere around $3,000.

Tech alumnus Malcolm Wells thinks we should all move underground. "Every construction project causes environmental trauma," he says. "Only underground architecture can heal the Earth’s wounds."

Wells has designed more than 100 underground houses, but living beneath the earth has been slow in gaining ground. He estimates there are less than 4,000 earth-covered or earth-sheltered homes in this country.

Yet, Americans seem to be looking for more environmentally friendly ways to live. Alumnus Mary Scott Christfield and her husband want to live as lightly on the Earth as possible. In building their retirement home in North Carolina, the Christfields are installing hydro-radiant cement floors as just one way to reduce their dependence on electricity.

Americans also have a fascination with what's going on next door. As a result, Tech alum Vern Yip is recognized everywhere he goes. His design expertise is featured on cable television's "Trading Spaces" and on magazine pages at newsstands everywhere.

Cable TV tunes in to the popular do-it-yourself movement in this country. Tech grad Charles Hanna Jr. came up with a timely topic for his book, "How to Manage the Design and Construction of Your Own Home — or Anything Else!"

Perhaps one day it will become popular to design our own underground homes, have our neighbors decorate them and talk to our refrigerators while the robot cooks dinner.
Environmentally Friendly

Energy-saving features worked into new home

By Kimberly Link-Wills

Mary Scott Christfield says some of her friends think she’s crazy for spending her weekdays overseeing construction of her retirement home and her nights sleeping in an RV on the Brevard, N.C., site.

Christfield, MS OR 78, returns to her Atlanta home and husband Jack on weekends. She has already retired from the computer industry. He will remain employed until the house is finished sometime next year.

She stays at the construction site, in part, to make sure the house’s nontraditional features are installed correctly. The hydro-radiant floor and passive solar design also have some of the Christfields’ friends scratching their heads.

“Our friends think the design and materials are very interesting, but they are a little mystified. They all say, ‘Oh really?’ They’ve never heard of a lot of these things,” she says.

The Christfields had never built their own home — with or without solar heating. “We educated ourselves,” she says. “We looked at a few houses that were on the market that had solar designs of various sorts. None of them was exactly what we had in mind. We bought the property about two years ago. We started with our own design, then we went to an architect for a little help along the way.

“We started out in the beginning saying that we wanted to be totally off the grid and totally self-sufficient. We pretty quickly realized that we could not afford to be off the grid. The cost of generating our own electricity was about triple the cost of buying it from the power company,” Christfield says.

“The most appealing thing to us was photovoltaic shingles, but they were in a state of development that just didn’t make them cost-effective. They’re very expensive. We couldn’t justify putting them on a house in an area where they could be hauled on and destroyed.

“We backed off that and decided simply to go with solar hot water, but we are using it to heat the main level of the house by putting in a hydro-radiant floor, which is hot water driven. The water goes through the solar panels first and heats up. Then the hot water circulates through pipes in the concrete floor and heats the lower 1,800 square feet of the house. We’re using a super-efficient German propane boiler as a backup,” Christfield says.

The upper 1,000 square feet will be heated by convection and a small heat pump, so small that at least one subcontractor again questioned Christfield’s sanity. She, however, has done her homework and says that the Southface Institute has been very helpful, both as an educational resource and by providing the sizing study for the heat pump.

“The house has a 135-degree middle angle. The back side faces solar south. The overhangs are designed specifically based on latitude so we expect significant solar heat gain in the wintertime in addition to the hydro-radiant tubes in the concrete floor. We also have a stone fireplace that will be solar heated a good part of the day by the sun passing across the back of the house. We’re counting on that thermal mass helping us as well,” she says.

A concrete floor may not sound like it would be visually appealing. Again, the Christfields researched and found just the right design.

“There are many things you can do with the floor. We have elected to finish the concrete because we concluded we couldn’t afford to install a hydro-radiant floor and then put tile or something on top of it. We were searching for something beautiful. We finally found it in an architect’s home in Asheville. We practically wept and threw ourselves at him.”

“We educated ourselves. We started with our own design, then we went to an architect for a little help along the way.”

Christfield says the architect agreed to show them how to finish their floor if they made a contribution to his favorite charity.

“You can make it look as if it has patterns and pathways. It is stained in sort of an airbrush style. It looks like a natural material, like a semi-precious stone. Most people would never guess it was finished concrete.”

The flooring upstairs will be unusual as well. “We’re going to use bamboo instead of hardwood. I didn’t want to feel like I was just chewing up wood. I decided I was going to do something ecological on the second floor. Bamboo is more expensive, but it’s harder than hardwood, comes prefinished and we can put it down ourselves. The particular one we’re going to use out of California has a 50-year warranty on the finish,” she says.

The Christfields are trying to further show their respect for the environment at the home site, situated 2,750 feet above sea level with magnificent views from every angle.

“We cut as small a hole in the forest as we could possibly cut. We can’t even turn a cement mixer around. They had to back up the hill. We chopped up the trees that were cut and mulched them and kept them here to use. Nothing was taken off. We didn’t haul away any trees,” Christfield says.

“I feel you ought to live as lightly on the Earth as you can. We may be able to get off the grid one day. We’ve tried to design the house so we could if it became cost-effective. We’d love to do that. This is a work in progress.”

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Power Up
Solar technology available to energize residential market

By Maria M. Lameiras

It is possible to energize an entire home with photovoltaic technology currently available and the cost and availability of the units are bringing the technology into popular reach.

“There are many homes in subdivisions around the United States and the world which are totally powered by PV or a combination of PV and grid energy,” says Ajeet Rohatgi, director of the Photovoltaic Research Center at Tech.

“The more popular or desirable way to use PV in buildings is what they call grid-connected PV, where they can have a portion of the energy provided from PV and another portion from the energy grid. Standalone PV is more popular in places where they don’t have power lines, such as in the desert or mountains or in villages in Third World countries where there are no power lines.”

Other alternative energy combinations include integrating PV with diesel generators or with diesel generators and wind-generated power.

“Everything exists right now to make this possible. They have even started selling things you can take and energize your home in places like Home Depot,” Rohatgi says. “The technology completely exists. The only downside is that it is a little bit more expensive than traditional electricity.”

The gap — about 8 cents per kilowatt hour for grid power versus 25 cents per kilowatt hour for PV — can be somewhat offset by integrating “green” energy materials into the building process instead of adding them after a structure is built.

“If you take the strategy, when building new homes, of replacing the roofing materials or the glass structures such as windows or skylights with PV instead of adding PV later, you have reduced the effective cost of PV because you have replaced other building materials,” Rohatgi says.

“There are many homes where the roof is made out of PV alone and, in fact, if you look at the canopy at the entrance of Georgia Tech’s natatorium, it is all PV panels. They have developed the technology to make PV panels strong enough for that application so they don’t leak.”

Recently, the U.S. Department of Energy sponsored a nationwide competition called the Solar Decathlon, which challenged university students to build the perfect, energy-efficient solar house. The entries were displayed in Washington, D.C., in October and may be viewed at http://www.ener.doe.gov/solar_decathlon/.

“You can see, not just PV alone, but all kinds of energy-efficient features and concepts are becoming quite popular,” Rohatgi says.
Hands On

Charlie Hanna applies Critical Path Management to empower home owners

By John Dunn

Charles G. Hanna Jr., who was the manager in charge of corporate construction projects for Ingersoll Rand in the 1970s and director of engineering for Revlon's corporate facilities in the 1980s, has written a book giving a hands-on approach to building a house.

Hanna, CE 62, of Denville, N.J., applies building principles in his book that he says empower people to manage the construction of their own homes and save a lot of money.

After starting his own consulting business, Hanna began writing his book. But he went through a divorce, and although he had outlined the concept of the book, he filed it away. It stayed there for a dozen years—until his younger brother's house was damaged by fire.

"He had hired an architect and was going to rebuild and, although it was a small house, it was going to cost him $250,000," Hanna says. "He had already taken those first steps when I heard about it. I said, 'Bob, let me help you. I know a little bit about this.'"

Hanna says he showed his brother and sister-in-law how they could rebuild the $250,000 Long Island house for $100,000.

"I showed him how to do it himself and manage the whole works," Hanna says. "His wife actually did the management and followed the concept. They didn't do everything I wanted them to do, but they built it for half the price. That gave me the incentive to finish the book."

Hanna spent the next year writing "How to Manage the Design and Construction of Your Own Home—or Anything Else!" He used Critical Path Management scheduling to prepare the book's outline and Critical Path Method logic for every chapter.

"I've taken the principles of the multimillion dollar projects and I've made them simple enough that they are applicable for a home—and anybody can understand it," he says.

To his surprise, Hanna says many of his readers have been housewives. "I've had a good response from a lot of women who have read it who are planning to build an addition to their houses or new houses."

When Hanna finished the book, he published it himself. It is available through Barnes and Noble, Borders and Amazon.com. He has made four appearances at Borders and four appearances at the Barnes and Noble in Patterson, N.J. He spends several days a month promoting the book, which sells for $60.

"Over the counter at a bookstore, that's a high price," he says. "But as a textbook, that's a low price. For a professional book, it's a very low price."

Hanna also plans to sell the book digitally, making the whole book available to download or available a chapter at a time. Although it will be the same book, he's putting a twist of the name on the cover: "How to Manage and Design the Construction of Anything—Even Your Own Home."

"I've had some phenomenal feedback, even from contractors," he says. Hanna is a proponent of modular construction, which he says is much faster, less expensive and superior to "stick built."

"I'll go to a modular manufacturer and I'll say, 'Give me a price on this.' They'll give you a price within a few days that will be to the penny to what it is going to cost and it will be delivered on the day they say it will come. Can you picture doing that on normal construction?" he asks.

By the time the foundation of a house is completed, modular construction will be finished. "It's delivered, set on the foundation and at the end of that day, you lock the door."

Another advantage of modular construction, he says, is year-round availability. "I can build right through winter because the modular unit is built in a factory."

In his preface, Hanna says the book was written to advise the owner how to best use the experts to design and build a home. He advises home owners to manage contractors, developers and architects.

"You can be in charge of the complete home-building process," he writes. "You will have at your disposal all of the management tools that have proven to be successful in the world's largest projects and are now equally applicable to the building of a house."

When the owner takes charge of the project, Hanna says, "you can build twice as much for the same price or get the home you wanted for half the price."
Two Georgia Tech couples started a business building homes together on a dare.

Longtime friends Paige Cosby Ruhl, Arch 88, MS Arch 90, her husband, Jim Ruhl, BC 88, and friends and neighbors Derek and Ann Murray Welch, both BC 89, own DreamBuilt, a high-end custom home design and construction business in Eatonton, Ga.

They started the company, near Lake Oconee, in 1999 with a huge leap of faith and now they specialize in making their clients’ dream homes a reality.

“We sit down with our clients and start with a wish list of what they want in the house. We do schematics of the design for them, then I flesh that out into a full set of working drawings for the project,” Paige says, adding that she has designed about 70 percent of the homes they have built to date.

“Then the guys take it and price it and put a contract to it,” she continues. “Then the homeowners start working with Ann on their selections for all of the finishes that will go into the house.”

The friends have overseen the construction of dozens of homes in lake-front and golf communities in the Lake Oconee area, from vacation and retirement homes to a sprawling 21,000-square-foot mansion that boasts, among other unique elements, a 10-head shower that uses 37 gallons of water per minute and has its own well.

“I coordinate the projects as a contact administrator. I make sure the customers make their selections on time for Jim and Derek to get them into the house,” Ann says. “I’m not an interior designer, but I try to keep the job on schedule and in budget. I make sure the clients know their allowances and that they don’t go over budget.”

DreamBuilt subcontracts the labor, but either Jim or Derek is on site every day overseeing the construction. “The key for us is we are small. We can concentrate on building fewer homes and give significantly more attention to those houses,” Derek says.

On average, the company spends about seven months on each house, with the homes typically ranging from 3,800 to 8,000 square feet.

The company has been successful because of its location, the partners say. “This is not a spec home market,” Jim says with a laugh. “The market down here is unique in that the builder doesn’t have to own the property.”

The story behind DreamBuilt is as interesting as the concept on which it is based.

Ann and Derek Welch were high school sweethearts in Roswell, Ga., but after graduation, Ann decided to study architectural engineering at Perm State, while Derek enrolled at Tech in building construction.

“In my family, there’s no discussing where you go. If you go to college, you go to Georgia Tech. There’s no such thing as another option,” says Derek with a laugh. His grandfather, Rudy Welch, attended Tech. His father, Fendall Welch, graduated in building construction in 1964; his great-uncle, Edward Welch, was an alumnus; and his sister, Erika Welch Laughlin, is a member of the class of 1985.
“We gave it two years of long-distance dating,” Ann says. “I knew I wanted to build houses. Derek was already in that program studying, so I came back.”

Meanwhile, Jim was studying aerospace engineering at Tech when he had an epiphany. “I decided after doing that a couple of years that it wasn’t really what I wanted to do. I transferred to building construction because that was what I’d always done. I had been working for a family friend in construction since I was 15,” Jim says.

Paige came to Tech by a more circuitous route. Her father, John Cosby, is a 1963 textiles graduate who assumed, since his daughter was interested in architecture, that she would go to Tech.

“I actually didn’t start out at Tech. I went to ‘another’ school. My parents were shocked. I went to the ‘other’ school for two years, then transferred into architecture at Tech,” Paige says. “I paid dearly for it. I had to start all over again. I knew I wanted to be an architect; I just battled going to Tech to begin with. When I ran out of general curriculum to take, I realized I had to change. That’s when I paid my penance.”

Paige met Jim at Tech and, through him, Ann and Derek.

“Ann and I had every class together since we transferred into building construction so late. We had to go back and take all of those freshman classes. We were the oldest two people in all of the classes,” Jim says.

Jim and Paige went on to graduate school — Paige at Tech in architecture and Jim earning his MBA at Emory — while Derek and Ann joined the workforce. After their graduate degrees, Jim and Paige also started their careers in Atlanta and the foursome worked their way up in their fields, maintaining their friendship through marriage and children. Paige and Jim have two children, Ethan, 8, and Haley, 6, and Ann and Derek have three boys, Joe, 7, Cooper, 5, and Rudy, 2. They even built houses next door to one another in Dunwoody.

“We were all working in jobs that were getting bigger and bigger and we were fighting Atlanta traffic and staying really busy. We had wonderful nannies taking care of our kids, but it still wasn’t us. We had long commutes and were overseeing other people running projects instead of being accountable for the work ourselves,” Paige says.

“We started talking, and ‘Let’s get back into control of our lives and start a business where we can run our own projects and it’s a manageable size so we can concentrate on our families.’”

After four or five months of talking about starting a building business together, “it just became sort of an ‘I dare you’ kind of a thing,” Ann says.

By February 1999, DreamBuilt was managing its first project. Three months later, both families moved to Lake Oconee. Word of mouth has kept them working ever since, including building their own houses — “next door” to one another on eight acres.

Clients have included Michael Thomas, executive director of Tech’s Center for Internet Research, Policy and Application, and Terry Blum, dean of the DuPree College of Management.

Thomas heard about the four ambitious Tech grads with the home-building company through a friend.

“We had a lot on Lake Oconee, so I gave them the lot number and they came out and we sat and talked. They made suggestions on the plans,” Thomas says. “We continued working with them and refined the plans. I asked them to give me a price. It was more than we could afford, so they worked with us to cut a few things out to get it in our budget.”

Thomas was a bit worried about hiring a builder for his 5,200-square-foot home. “I had been dread ing it because I heard so many horror stories from people who’d had houses built, but we had absolutely no problems. They built the house and they were great to work with. Our neighbors even came over and said they were impressed with our builder because there were a lot of people working on the house and they were there all the time.”

Blum and her husband, Paul Roman, also had a home at Lake Oconee constructed by DreamBuilt.

“We’ve had a lot of experience with doing renovations and building and by far this was our best experience,” Blum says. “They did not design the house, but they were able to help with the details left off of the original blueprints and building documents. Having them to help and them having the taste and experience they have really made it painless.

“They are very well educated, they have good taste and good social skills. They finished ahead of time and under budget. They are just Yellow Jackets,” Blum says.

The first people to reap the benefits of the quartet’s experience were Mike and Judy Meredith, who retired to Lake Oconee from Detroit.

“We had lived in Atlanta and we had friends at Lake Oconee. We decided to build down here when Mike retired, but we kept hearing things we didn’t like about other people’s building experiences,” Judy Meredith says.

After several meetings, the Merediths agreed to give DreamBuilt its first job.

“It was the best opportunity for us because this was their first home in their new business. We were their model home, so we knew they’d build a good house for us and for them. Even after we moved in we were still showing the house to their potential clients and I still would today if they called and asked,” Meredith says.

Paige says the leap of faith she and her partners took has paid off, but with great effort.

“There are a lot of people who warned us about going into business with friends. A lot of people told us, ‘Never let a friend build your house. Never go into business with a friend. Never live next door to a friend,’” Paige says.

“We had to go into this with our eyes open and say, ‘If all this doesn’t work out, what is the most important thing?’ It’s not the business. We do what it takes to maintain the friendship and to keep our heads on straight and I think we have been very successful at it. We took a huge risk in coming out here, but we knew what we were getting into.

“We knew too that we were young enough to recover from it if we took a risk and it turned out to be the wrong decision,” Paige says.

Ann adds, “And we were doing it together. It is easier when you have your friends with you.”
Building for Boomers

Baby boomers approaching retirement find ‘awesome’ spaces appealing to active lifestyles

By Neil B. McGahee

In 1946, postwar America was welcoming veterans home by the boatloads. The United Nations met for the first time to discuss Winston Churchill’s warning of an “Iron Curtain” descending over Eastern Europe and Joe Louis successfully defended his heavyweight boxing title for the 23rd time.

And there were babies — lots of babies.

More than 7 million were born from 1946 to 1964, a period dubbed the “baby boom.” Now those boomers are facing retirement, and their housing needs are more pressing than ever.

Quincy Johnson, Arch 72, president and CEO of Quincy Johnson Architects in Boca Raton, Fla., is considered an expert on housing design for seniors. A boomer himself, Johnson recently judged the National Association of Home Builders’ “Best of Seniors Housing Design Awards” competition in Washington, D.C.

“Something like 10,000 to 15,000 people a day are reaching their 50th birthdays,” he says. “The median age of the baby boomers is 48, which means there are as many on the front side as there are on the back side. There has never been a housing market this big or this concentrated. It presents a wonderful opportunity for home builders, developers and marketers to focus on this market.

“These people don’t really think they’re getting old, so we have to design homes for the active adult,” he says. “Their lifestyle wants fun, sexy bathrooms — walk-in tubs and showers with water coming out of the ceiling like a waterfall in a Costa Rican rain forest.

“They want kitchens that are detailed and well-designed. These folks have lived in as many as five houses, and they don’t want what they had in the last house. This one has to be perfect.”

Johnson says the majority of the designs he saw at the competition were more wrong than right. The winners, he says, were right on the money as far as having the desirable elements the boomers prefer.

“These buyers will have a positive or a negative buying attitude in the first five seconds,” Johnson says. “We have analyzed home sales and found that 40 percent of their decision is based on the overall perception at the front door, 30 percent in the kitchen and 30 percent in the master suite.

“We found that when they walk in the front door, they want to see a wide-open space with a long, diagonal view. These buyers want a lot of space, so they opt for a great room concept as opposed to a formal living room and den. They want one awesome, fantastic, wonderful living area. It doesn’t matter if it’s a $100,000 house or a $1 million house, this concept works.”

Johnson says the woman usually bases her decision on the kitchen. “She wants a large pantry. More than 90 percent of the product I see designed for this market undersizes the pantry. These folks want to go to Sam’s Club and buy a month’s stock, and they don’t want to have to try to stuff it into a dinky little closet. They also entertain frequently, so they want a work island and a pass-through to a bar area.”

Johnson says the master suite also plays an important role in the buying decision. “You have to realize how much time is spent in the master suite.”

Design heritage is also very important to this buyer. “Every area of the country has a unique design,” he says. “Atlanta has Georgian Colonial. Charleston, Savannah, New Orleans — they all have a style unique to their areas, and it’s extremely important for buyers to be confident of the style heritage of their homes. They’re not going to buy something weird and strange. They don’t want some high-tech-looking building, but they want all the high-tech stuff inside.”

Johnson says the No. 1 thing missing in the homes he judged was “brain space.”

“This market is the fastest-growing Internet connector market in the world other than China,” he says. “These folks check their e-mails like other generations did their mailboxes, so there has to be a designated space for their faxes, computers and phones. Successful design for this age group has to incorporate space for technology.”

Another issue is aging in place, Johnson says.

“We have to design these homes to be flexible,” he says. “We have to anticipate space needs 20 years down the road to accommodate wheelchairs in the kitchen or the installation of a handrail in the shower or the easy conversion of a toilet to a handicapped toilet.

“When active adults downsize, they want their home to be designed so it can change along with the inevitable life changes that come in their later years.”
Helpful Home
Technology gives house a sense of awareness

The future house is here and technologically astute.

Aware Home, constructed near the Georgia Tech campus in 2000 is part of the Broadband Institute Residential Laboratory’s testing ground for development of computing applications in a home environment.

The unassuming three-story house features two identical and independent living spaces with two bedrooms, two bathrooms, an office, kitchen, dining room, living room and a laundry room. A shared basement provides an entertainment area and a control room for centralized computing services.

While Aware Home includes high-tech information and entertainment services, it also provides an opportunity for researchers to identify those who would benefit from interaction between humans and computers. The residential laboratory is constantly connected by broadband communications allowing researchers to study how technology interacts with and affects lifestyles.

One of the primary beneficiaries of the project is the elderly. Researchers are trying to extend the time seniors live at home by using computer-based applications. These technologies benefit not only older adults but other groups with cognitive or physical impairments.

Sensors placed throughout the house and wearable computer devices provide an interface that allows researchers to track a resident’s habits and behaviors.

One of these tracking technologies is called a “smart floor,” a system that identifies and locates a person based solely on his or her footsteps. Strategically sized and located force-sensitive load tiles gather data known as ground reaction force profiles. Using that data, researchers are able to create footstep models for each person, then assign a profile to each resident, allowing them to track the people inside.

By learning about the residents’ activities, the systems that are built into the house can provide complex tasks to support their needs.

In addition to allowing the elderly to live independently, applications developed at Aware Home may someday help parents keep track of infants and toddlers, turn lights on and off when someone enters or leaves a room, and even find commonly misplaced items such as car keys and eyeglasses.

— Neil B. McGahee

Robotic Friends
The time is coming when robots will care for our daily needs, down to basic companionship.

Ronald C. Arkin, director of the Mobile Robot Laboratory in Tech’s College of Computing, says robotics research and development is “on the cusp” of breakthroughs that will be used every day for convenience, entertainment and assistance.

“One of the things that is commercially available right now is the Roomba, developed by our colleagues at MIT, which is a small vacuum cleaner that runs around your house and keeps it clean,” Arkin says of the compact, battery-operated unit guided by infrared sensors. “You just stick it in a room and it figures out how to clean the room.”

Arkin, a consultant for Sony and other commercial companies doing robotics research, is on the advisory board of Evolution Robotics, a company working on recognition and tracking software that could be used with companion robots to “teach” them to do simple tasks.

“Sony has the Aibo robot dog,” Arkin says. “We are also looking at these robots as high-fidelity models of animal and human behavior and we feel they will ultimately be viewed as real partners that people will want to keep around for a long time.”

In addition to the robots available now, a humanoid Dream Robot being developed by Sony is expected to be out in about a year.

“It is about knee-high and it is intended to be a friend,” Arkin says. “And one day you might even be able to get your Dream Robot to take your Aibo for a walk.”

Honda is also working on a large, walking humanoid robot called ASIMO, which is being developed as an aid for the elderly and currently can be rented for use as a receptionist.

Although the technology is not yet “rock solid,” Arkin anticipates widespread use of robots “definitely” within the next 20 years.

— Maria M. Laneiras
Underground Architecture

The ideal house would not be built above ground

By Malcolm Wells

In the 1950s, no one in the construction business could fail. I became an architect in 1953 and soon had big corporations as clients. I made more money than a young man should, and I happily specified the clearing of forests and the filling of wetlands to make room for my facilities and office buildings as well as for vast parking lots.

It took me 10 years to realize that there was a better way — let the land live, put “manworks” underground. The 10 years might have been 11 or 12 if I hadn’t been smartened up by an education at Georgia Tech.

Did you know that underground buildings are dry and sunny, that they are silent and fire-safe, easy to heat and cool, long lasting, almost maintenance free and heal the “Earth wounds” caused by their own construction?

Every square foot of this planet’s surface — land and sea — is supposed to be robustly alive. It is not supposed to be shopping centered, parking lotted, asphalted, concreted, condoed, housed, mowed, polluted, poisoned, trampled or in any other way strangled so that we — just one of a million species — can keep on making mistakes.

Every inch of America can be parkland if we clean up our act. The idea of a continental park is no joke. The goal, of course, is not just a national park, but a worldwide park — an earthly paradise.

But the underground architecture movement has been slow getting off — or rather into — the ground. After more than 30 years, the United States can boast only about 4,000 earth-covered or earth-sheltered houses.

Over the past 34 years, I’ve designed more than 100 underground houses, and I’ve seen or visited more than 500 underground houses. They were designed and built by all kinds of people, some with construction experience, some without. Of those 500, a few were beautiful, most were OK and a fair-sized group were downright ugly. They had not been designed with harmony, grace and repose in mind. Energy savings was the usual motive.

The houses, both good and bad, did actually conserve energy. They were cool in summer, warm in winter and asked very little of their cooling and heating systems. The houses had something else in common too. They quickly merged into the living world, becoming little more visually than windows in the wildflowers. Architecture had come home at last. Only those owners who felt compelled to mow their roofs missed it.

I’ve lived in four of my underground buildings. The first had dampness problems caused by condensation — water deposited on cool surfaces by warm, moist air — because I’d failed to insulate the walls from the surrounding cool earth. It’s a phenomenon familiar to millions of us who’ve had basements — cool walls plus moist air equals mildew.

My next three buildings, all well insulated, were bone dry. None of the waterproofing has ever leaked. They were, and are, bright and sunny inside, cool in summer, warm in winter.

Underground construction costs vary too much from region to region, from one design to another. Many contractors are edgy about tackling this strange new way of building, and they may at first submit inflated estimates. An underground house, because of its beefy structure and premium waterproofing, usually runs about 10 percent more than an above-ground house of the same size and comparable finish. The savings on fewer exterior finishes and a less complicated roof just don’t equal the extras.

You can adapt your underground dream house to almost any site. It can be flat or sloped in any direction. Try to fit, rather than struggle against, the character of the land. The objects of the attempt are things like appropriateness, compatibility, serenity and beauty. Think about the least damaging way to build.

We read of green roofs appearing here and there in our cities. Are they the forerunners of a green future? Will we have clean skies and sparkling waters again? Will we wake up in time?

I think we will.

Malcolm Wells, Cls 47, and wife Karen run the Underground Art Gallery out of their below-ground home in Brewster, Mass. Wells calls himself a “backdoor architect.” He attended Georgia Tech as part of the Navy V-12 program. “I never did graduate, but in the postwar period, a degree wasn’t required for an architectural license. After working six years in an architect’s office, I could hang out a shingle and call myself a registered architect.” He has written about 20 books on underground architecture. His book, “How to Build an Underground House,” received a rave review from Publishers’ Weekly, which included “boldly blazing the way for others.” The self-published book, which sells for $12, plus $2 shipping, is available from the author at 673 Satucket Road, Brewster, MA 02631.
Natural Instincts

Tom Ventulett envisioned a home that stood in harmony with nature. His concept took shape on a pristine 10-acre parcel nestled within Atlanta’s perimeter. Shielded by dense woods framing a pond, the land was quite a find for Ventulett, who bought it from a friend and built his home more than 20 years ago. It has served his family’s needs and fed his senses ever since.

“My house is wed to the site,” says Ventulett, BS 57, Arch 58, design principal of Thompson, Ventulett, Stainback and Associates. “It’s situated so the trees shade it in the summertime. In the wintertime, the sun is low and it reaches deep into the house to warm it.”

Ventulett says his home is one to live in, not look at. “It’s a house that flows. It’s a real living space as opposed to the traditional dining room, foyer, living room kind of setup. You don’t come in through the garage. You come in through the front door. It doesn’t matter if you’re living there or whether you are visiting. We fully live in our rooms. We don’t have a room set up just as a reception area for people.”

Ventulett grants that his home is equipped with “a few gadgets. We all like gadgets. I have lighting systems so you can tone everything to get just the right amount of light on certain things, mood-setting elements and changes to compensate for lightness and darkness outside.”

Still, he relies on elements from outside to “balance the high-tech stuff that is all manmade.”

Ventulett heartily endorses loft housing, which he calls a “whole wonderful attitude about urban living. They’re tailoring the space to just what they need as opposed to some look. It’s wide open.”

“My mom and dad kind of knew that was what I always wanted to do because, as a kid, my favorite toys were Legos,” Yip says. “I was forever building skyscrapers and buildings. When I was 10, my mother let me design my own bedroom. I designed the furniture and they had it built. Even then it was stainless steel and very clean.”

Trading Careers

Alum gives up medical school and finds fame as designer

By Maria M. Lameiras

Fans of The Learning Channel’s “Trading Spaces” design series love Vern Yip.

Maybe it’s the clean, functional designs he is known for, or perhaps it’s his dedication to his art and those it is meant to serve. Whatever it is, Yip’s popularity on the hit cable show is undeniable.

Yip is serving his fellow man in a much different way than he’d anticipated when he graduated from the University of Virginia in 1990 with dual degrees in economics and chemistry.

“I’d been accepted to the University of Virginia Medical School. Two weeks before med school started, I told my folks I wasn’t going,” Yip says.

Instead, he planned to pursue architecture. Yip has since earned two master’s degrees from Tech.

“My mom and dad kind of knew that was what I always wanted to do because, as a kid, my favorite toys were Legos,” Yip says. “I was forever building skyscrapers and buildings. When I was 10, my mother let me design my own bedroom. I designed the furniture and they had it built. Even then it was stainless steel and very clean.”

Yip took a year off to put together a portfolio to apply to architecture and business programs around the country.

“When I decided to make the shift, I went to New York and spoke to I.M. Pei, who was a friend of my family. He recommended Tech as a great program for both degrees I
was interested in," says Yip, who earned a master's degree in management in 1994 and a master's in architecture in 1995.

"I am doing what I love, I'm like a fish in water. I wish everyone could wake up in the morning and do what they were meant to do," he says. "I always felt that, whatever I ended up doing, I wanted there to be a sense that I was contributing to the whole rather than just myself. I love what I am able to do for people."

Even before graduating, Yip began working as an architectural draftsman with Thompson, Ventulett, Stainback & Associates in 1995. A few months after beginning his job, Yip was doing some hand drawings when interior design principal Paula Stafford told him he should try design.

"She saw something in me and gave me the opportunity to design the corporate headquarters for Disney," says Yip, who later joined the Atlanta design firm Cooper Carry and began a lucrative side business with two friends importing 16th through mid-19th century Chinese antiques.

The side project garnered much attention, including articles in the Atlanta Journal-Constitution and on CNN. From that attention, Yip was contacted to design Fusebox, an Asian fusion restaurant in Midtown Atlanta that, at its height, was heralded by Atlanta Journal-Constitution food critic John Kessler, who wrote, "If there's a more beautiful restaurant in Atlanta, I haven't found it."

Yip created the glamorous gathering spot from crude materials — a former gas station. The buzz created led to bigger and better things for Yip.

In 1999, he opened his own firm in Atlanta, Vern Yip Designs. Since then he has had a steady stream of clients, all referred by word of mouth. In 2000, he was awarded the prestigious Southeastern Designer of the Year Award and came to the attention of Ross Television in Tennessee, the production company that originally brought the English hit show "Changing Rooms" to the United States as "Trading Spaces."

Yip was invited to join the popular do-it-yourself home redecorating show with the interesting premise.

On the show, two neighboring duos, each with a $1,000 budget and a professional interior designer, switch homes for 48 hours and transform a room in the other's house. They are allowed neither to give an opinion nor peek at what's being done to their own homes while they work on their neighbors'. The show culminates with the couples returning to their own homes to see the result of their friends' hard work. The outcomes have ranged from squeals of joy to tears of horror.

Yip is one of a team of six designers chosen for their different design approaches and personalities. He views tapes of the participants and their homes before he goes on location and tries to incorporate the home owners' lifestyles into his designs.

"I try to pay attention, to get a sense of how these people live their lives. I get to go home after two days, but I leave my design. This is something they live in every day. It is an integral part of their families' lives and I feel a huge amount of responsibility to them. Most people may not have the opportunity to hire a professional designer and I look at it as leaving the room as a gift for them," he says.

"I try to blend the room into a reflection of who they are, but I also feel responsible not to do just what they would do, but to do something they may not have thought of and to make it interesting for the people who are watching."

He never anticipated how wide the show's appeal would be. "It is amazing. Men, women, old, young — I can't believe the variety of people who watch and how much they like it."

Yip recently launched his own Web site to provide advice on interior design — www.vernyip.com — and continues to do residential and commercial design work in Atlanta.

The time and travel required by the show combined with his responsibilities in Atlanta make for a hectic schedule. "I work seven days a week, 22 hours a day, and I'm on planes a lot," Yip says with a grin. "But it is amazing what you can do when you are doing what you love to do. That makes it easy."
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Thwarting Terror
Sam Nunn tells GTAB multinational cooperation is ‘absolutely necessary’

By David Nordan

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Sam Nunn fears the United States could win the battle against terrorism but still lose the war. Nunn, former chairman of the Senate Armed Services Committee, told the Georgia Tech Advisory Board in November that the United States can quickly dominate any military conflict or prevail over the terrorist threat.

But the nation’s policy has to be in line with a global effort, Nunn told about 50 advisory board members during an hour-long presentation in the Wardlaw Center.

“It is absolutely necessary to have multinational cooperation,” Nunn says. “No matter how strong America is — and we are the strongest in the world — we cannot protect ourselves against international terrorism without cooperation from other countries in the world.”

Nunn says it is essential to get Russia’s cooperation because the country has huge stockpiles of nuclear, chemical and biological materials not properly protected and thousands of underemployed scientists and technicians with the knowledge to build weapons of mass destruction.

“We’ve got to get them on the team if we have any hope of containing violence and danger on a massive scale,” Nunn says, stressing the need for any U.S. military effort, including an invasion of Iraq, to be carried out with global support.

“The bottom line is we can’t afford to alienate 1.2 billion Muslims in the world. We’ve got to separate those who are violent from the vast majority who are basically peaceful,” he says. “If we don’t do that, we will win the battle but lose the war.”

Nunn is director of the Nuclear Threat Initiative, a hands-on organization financed by Ted Turner to remove nuclear weapons material from vulnerable locations. He also is chairman of the board of the Center for Strategic and International Studies, a group in Washington, D.C., seeking practical ways to deal with the threat of international terrorism. And he is a distinguished professor in the Sam Nunn School of International Affairs at Georgia Tech.

The focus on terrorism and the weapons inspections in Iraq have brought these roles and institutions to new levels of relevancy and urgency.

Last August the NTI, with $5 million of Turner’s money, financed and oversaw the removal of two-and-a-half bombs worth of enriched uranium from a poorly guarded site in Yugoslavia that Nunn describes as “a terrorist’s dream.” He said the cleanup never would have happened if President George W. Bush had to go to Congress for the money.

Nunn orchestrates his time between the Washington-based jobs and his position as senior partner at the King and Spalding law firm in Atlanta. He and wife Colleen live in Midtown Atlanta. He also serves as a board member of ChevronTexaco Corp., The Coca Cola Co., Dell Computer Corp., General Electric, Internet Security Systems and Scientific Atlanta.

This foot in the business world, he says, has been both fun and instructive. “Every board meeting is an education. “The greatest challenge to American business is to restore the confidence of the American people. There
Shaping Policy
Tech could forge strategic role on technological issues

Georgia Tech's prowess in science and technology could forge a role for the Institute in shaping public policy.

Speaking to the Georgia Tech Advisory Board at its biannual meeting in November, President Wayne Clough said, "We must have a connection between science and technology and the great debates that are under way."

Fresh from a national gathering on information technology's place in homeland security, Clough says Tech is taking its place as a player in the formation of national policy.

"Georgia Tech's expertise in science and technology puts it in a unique position to improve public understanding of complex issues and to assist local and national government leaders to understand how we can best respond to the urgent questions we face today."

"These include how we protect ourselves against chemical, biological and cyber-terrorism, helping save our fragile environment and using technology to improve our lives and cities," Clough says.

As the nation seeks ways to deal with the complex threat of international terrorism, Tech will be among the universities facing increasing technological challenges.

Clough says Tech was one of the first schools asked to send a team to Ground Zero following the Sept. 11 attack. The mission was to devise ways to centralize communications between the myriad of first responder teams reporting to the World Trade Center disaster.

Sam Nunn, who heads two Washington think tanks on national security and policy, presses home the point. "We've got a lot of faults (in homeland security) response and a lot of challenges. Our technical people — our scientists, technologists and engineers — have to play a major, major role. All this is going to be a huge challenge."

While national security concerns have revolved mostly around possible nuclear, chemical and biological attacks on a large scale, Nunn and others warn that the threat to the national economy looms large through the potential for communications terrorism on a global scale.

Another speaker, BellSouth Georgia operations president Phil Jacobs, points to the potential for technology as a tool for fighting all forms of terrorism. He mentions bio-sensors being developed by Georgia Tech researchers to make his point.

"Imagine the implications. With much of the research being done at Tech, we now have the capability of electronically representing e-coli samples so that they can be immediately transferred to labs where they can match the agent without ever having to touch it."

Jacobs outlines the current contradictions in communications development with two extreme examples.

The Georgia State Patrol and the Atlanta Police Department communications systems are incompatible, prohibiting direct communications in emergency situations, Jacobs says. "If an attack took place on the Georgia Capitol, there would be no way to communicate with Atlanta police.

"But what if I were to tell you that there is a network in Georgia today attached to over 3,000 locations around the state capable of instantly identifying an event and networking with similar networks in at least 15 states around the country. It's the lottery," Jacobs says.

"The implications are that we don't owe it to the public to tell them they've been exposed to anthrax or e-coli and such as to tell them whether they've hit the Powerball."

is no question it's going to take time," Nunn says. "But we'll come out of it better. The great thing about the American system is self-correction. We saw it in government and we will see it in business."

These roles have also given rise to thoughts about the threat of eco-terrorism to America and the potential disruption of information in a global era. He says this is where Georgia Tech will find itself involved in increasingly important roles. Technology is a tool for combating terrorism on all fronts — biological, chemical, nuclear and economical. "That is vital to the country's future."

Nunn endorsed Tech playing an expanded role in shaping national, state and local public policy.

Nunn was regarded as "Mr. Defense" in Washington, where he wielded congressional power over the military as his Democratic role model Georgia Sen. Richard B. Russell did. Russell died in 1971 and Nunn made a bid for his seat. He also chaired the Permanent Committee on Investigations.

In terms of voice and profile, few former members of Congress have maintained the level of influence and recognition Nunn has since giving up his seat in the Senate in 1996.

Nunn came to Georgia Tech after a stellar high school basketball career. The Atlanta Journal-Constitution called him the "awesome" star of the 1956 state championship squad of his hometown of Perry.

Nunn entered Tech in 1956 and earned a spot on the Georgia Tech basketball traveling squad during his sophomore year, despite topping out at less than 5 feet 11 inches. He remained at Tech through his junior year and transferred to Emory Law School, earning undergraduate and graduate degrees and receiving his law degree in 1962.

He served in the U.S. Coast Guard and worked in the Washington offices of Carl Vinson, his uncle, a legendary House defense chairman and "father of the two-ocean Navy" who presided in Congress over the military establishment during the Franklin Roosevelt era.

Nunn returned to Perry to practice law, served in the state House and was elected to the U.S. Senate in 1972.

Winter 2003 • GEORGIA TECH 47
Distinctly Tech

**Buzz Desk Box** – $68.95
9” x 9” x 4”

**Wreck Desk Box** – $68.95
12” x 7” x 4”

These boxes and end tables are manufactured in Toccoa, Georgia. Made out of chestnut wood. All items lift open with hinged back.

**Buzz End Table** – $164.95
11” x 16” x 23”

**Wreck End Table** – $164.95
11” x 16” x 23”

**Glass Paperweight** – $34.95
Cast from pure American glass rimmed in gold with a felt base. One line of personalization available. Size: 3” x 4”

**Note Card Set** – $13.95
Made of elegant, heavyweight creme stock. “Georgia Institute of Technology” appears under the illustration of the Tower. The inside is blank. Notecard size is 4” x 5”. Each set of eight cards comes packaged in a folder with the illustration rimmed in gold.

**Order Form**

- **Wreck End Table** – $164.95
- **Buzz End Table** – $164.95
- **Buzz Desk Box** – $68.95
- **Wreck Desk Box** – $68.95
- **Note Card Set** – $13.95
- **Glass Paperweight** – $34.95
- **Glass Photo Frame** – $69.95
- **Ink Picture** – $94.95
- **Painted Picture** – $149.95
- **Ink Mirror** – $139.95
- **Painted Mirror** – $209.95
- **Ink Desk Box** – $209.95
- **Painted Desk Box** – $209.95
- **“Personalization per item”** – $10.00

All Prices Include Shipping Charges. Georgia Residents add 7% sales tax.

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* Personalization

Limit 30 characters per line

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**Ink Mirror with Gold Frame** – $139.95

This is a distinguished gift for that new graduate or alumnus celebrating a reunion. Two lines of personalization available for the ink engraving mirror only. Size: 12” x 25”

**Painted Mirror with Silver Frame** – $209.95

Made of substantial glass with an easel back. One line of personalization available. Overall size: 8” x 10”

**Glass Photo Frame** – $69.95

Made of substantial glass with an easel back. One line of personalization available. Overall size: 8” x 10”

**Ink Desk Box** – $139.95

Exclusive Desk Boxes make handsome additions to any home or office. Made of hand-finished poplar wood. Both styles appointed with a full mirror under the cover. Two lines of personalization available for the Ink Desk Box only. Size: Ink Desk Box 9” x 11” x 2”, Painted Desk Box 9” x 13” x 2”

Eglomisé Designs offers historic views of American colleges – including Georgia Tech’s own Tech Tower. Eglomisé painting was popularized in the 18th century in France and was named after the artisan who developed the technique of applying and blending paint directly on the reverse side of glass. All “painted” items listed here are created using the Eglomisé style.
Everything changed for John Bland when he witnessed children scavenging in mounds of rotting garbage for scraps of food to eat. His journey to help the starving people of Chinandega, Nicaragua, would lead him away from the software company he co-founded to serve as the executive director of Amigos for Christ. "I just followed what God was calling me to do," says Bland, MgtSci 83.

In 1998, while a partner at Effective Technologies and volunteering as a youth leader at Prince of Peace Catholic Church in Buford, Ga., Bland spearheaded a fund-raiser to help feed the children of Chinandega. "We were looking for a service project for the high school kids. Through an international organization, we found a project to raise money to build a cafeteria for kids who were eating at a garbage dump in Chinandega," Bland says.

"I decided to go down to Nicaragua with a friend of mine to check out the place and see the reality of what we were doing. I was in the Peace Corps for two years in Paraguay after I graduated from Tech. I had a pretty good feel for what it was going to be like," he says. "This was a lot worse. The poverty level was extreme."

A missionary took Bland, armed with a video camera, to the Chinandega dump. "It was unbelievable, watching kids sifting through the dump, eating food they found. It was terrible. When we came back, I showed the video to the kids at youth group. The motivation to do something more was there," he says.

In October 1998, Hurricane Mitch ravaged Nicaragua. A mudslide killed 3,000 people in Chinandega. An already desperate situation was made almost incomprehensibly bleak.

In April 1999, Bland led a youth mission trip to Chinandega, where 20 teens and 18 adults spent spring break working on three houses. He says that on the plane trip back to Atlanta, he felt God calling him to form a nonprofit organization. He shared the idea with other Prince of Peace youth group members and leaders. One suggested the name, Amigos for Christ.

"There were a few of us who started the process and formed a board of directors. We got everything legal. We got our 501C3 (nonprofit tax status). All of us were volunteers," Bland says.

"I could devote a little bit more time because of my job in software. This was my main hobby, so to speak. We started getting a lot more support financially from the church and from a private foundation.

"At some point, I said, 'I'd like to do this full time.' It had been on my mind for a while. 'Is this plausible?"
Can we raise enough money so I can still feed my family? I have a wife and three children. That was in 2000,” says Bland. “A gentleman said, ‘Here’s some money so you can live for the next six months,’ and he gave us a check. The board said, ‘Let’s go for it.’”

Amigos for Christ was still based at Prince of Peace. “Up till then, it was strictly cash donations funding projects. Our first big one was a medical van and a medical clinic. We wrote a letter to the parishioners saying we needed a place to operate.”

A church member set up a meeting between Bland and the owner of a Buford business park at one of his buildings. “I said, ‘Which one of these rooms in this office could we use?’ He said, ‘The whole thing is for you.’”

Amigos for Christ now occupies the entire office and a warehouse to stockpile medical supplies and sports equipment to be shipped to Chinandega. “He gave it to us. Everything except about $100 a month in utilities is free,” Bland says.

A private foundation stepped in to cover nearly all operating costs, including Bland’s salary. “Of what we take in, 1.3 percent goes to our operating costs. Literally almost 100 percent of what people give us goes right to Chinandega.”

Moving the people of Chinandega from dwellings often made of cardboard and plastic into structurally sound houses was a top priority.

“The government put the survivors of the mudslide on land right next to the dump. One of the big projects was to get some 300 families out of there. We worked with a couple of other organizations and built 300 houses in two years.”

Materials for each house cost about $2,000. Made of concrete slabs, a house consists of four rooms. There is no indoor plumbing or electricity. When completed, a deed is handed to a grateful Nicaraguan family.

Amigos for Christ didn’t stop with the houses, Bland says. “Once the homes were built, we built the school. We pay the teachers’ salaries. We pay for food. You’ve got to provide a lunch, because if you don’t do that as the motivation to come, they won’t show up.”

“Education is everything. What we’re trying to do through the education process is teach them a skill. We’ve got vocational schools teaching carpentry, sewing, metal mechanics. They’re building the hand pumps we use for the water wells. We’ve drilled four wells.”

In order to buy a drilling rig, Bland again wrote a letter to parishioners, this time asking for donations to cover the $30,000 cost. During Christmas services in 2001, the door to
the Prince of Peace sanctuary opened and someone handed an envelope to an usher. "Make sure this gets to Amigos for Christ," he said.

"The usher put it in his pocket. After the service, he opened it, and it was a check for $30,000. I don't even know what the man looks like. He's given us $60,000, $70,000," Bland says.

Another parishioner introduced Bland to a friend in Mobile, Ala., who wanted to help the poor. "We sat down with him and told him we wanted to build a surgical hospital. He gave us $270,000 right there. Now he's on the board of directors and we're opening an office in Mobile.

"We also have a free clinic. We employ a doctor, a nurse and a dentist. We bought a SUV and we employ another doctor who goes out into the rural areas and does family practice every day."

Once a year Amigos for Christ brings the Getsemani Boys Choir from Chinandega for performances in Atlanta and New Orleans, where the organization also maintains an office. Through concerts and CD sales this year, $150,000 was raised — enough to support Chinandega schools for a year.

"We want communities to have a school. We want them to have clean water. We want them to have latrines and decent houses. We really want to work ourselves out of a job, although that’s not going to happen. When you get out to the rural areas, there’s enough work there to last a lifetime."

An offshoot, PCs for Christ, is working to put computers in the vocational and secondary schools, the only ones that have electricity. A 70-acre ranch is being equipped with an irrigation system to help the Nicaraguans raise their own crops.

Since its inception, Amigos for Christ has sent more than $8.5 million in aid to Chinandega. Bland will escort a Marist High School youth group on a mission trip this spring. And he and wife Sabrina, who attended Tech for a year before pursuing a nursing degree at Georgia State, will take their three children, ages 12, 10 and 7, to spend the entire summer working there.

Bland’s friend and fellow Tech alum Russ Turco, EE 85, traveled to Chinandega in November to help at the ranch. Jimmy Adams, CE 71, left civil engineering to become a Catholic priest. After serving at Prince of Peace, he worked in Chinandega for a year.

They are just two of the nearly 400 people who have traveled on Amigos for Christ mission trips to Chinandega. For all of them, Bland says, the experience is "life altering. It changes everything."
Screening Stocks
Alum founds innovative company

By John Dunn

A few years ago, John M. Siegel Jr. worried about choosing the best stocks to buy. He worked out a solution, designing computer algorithms to analyze and pick stocks, and launched a company that has impressed financial media wizards.

Siegel, ME 90, MS ME 92, PhD 94, is president of Stockworm, a Huntsville, Ala., company he co-founded in 1998 that screens and analyzes stocks. It has made Forbes magazine’s “Best of the Web” list for two consecutive years and is included in Barron’s list of top screeners.

“Stockworm is an innovative Web site devoted to finding better ways to screen for stocks,” Forbes magazine advised. The site is www.stockworm.com.

“It’s been an adventure,” says Siegel, who founded Stockworm with Fyodor Golos, the company’s vice president and technical partner. James Hudson Jr., founder of Research Genetics in Huntsville, is a principal.

In 1997, Siegel and Golos were working at a Huntsville research company, puzzling over what stocks to buy for their 401k plans. Siegel says they read financial magazines to get picks. But every magazine had its own list of favorites, and Siegel had no way to make an objective evaluation of which stocks were best.

“That’s when I put my nose to the grindstone and applied some of the techniques I had learned doing research at Georgia Tech,” Siegel says.

“I started looking at the academic papers on stock valuation and tried to get a feel of what was happening in economics in that field. What I drew from that was some of the original formulations that we put into that program. The only thing that we needed was the data, and that is where the worm came in — getting data to analyze bunches of stocks instead of one.”

Siegel says he and Golos pursued their research as a hobby that would provide some understanding over “what had been a bit of a mystery.”

“We didn’t start out with a data feed and this big commercial concept,” Siegel says. “Stockworm was the name of a little program we had written. We started using it profitably on our own and eventually started expanding it as a commercial project.”

The company presents three primary methods of stock analysis. Checking out a stock tip or recommended stock is one method, finding stocks that meet specific investing criteria or preferences is a second. Automatically managing stock portfolios is the third.

“If someone recommends a stock, I want to know if it is worth buying. How do you figure out whether the stock is a good buy or not?” Siegel asks. “We feel like we’ve developed some superior tools for that. One obvious capability is the valuation models — just go and see what the dollar value of a stock is according to the models. Is it trading at a price that is higher than its value or lower than its value?”

Another feature shows investors whether a stock’s price-to-earnings is high, low or average compared to the market and to the industry of the stock. Other parameters include market capitalization, valuation and earnings growth. Financial parameters are analyzed through the method of market and industry comparison.

Color graphics provide a visual stock evaluation. Stocks that are doing well in a particular category are displayed on tall, green bars. Those not performing well will point downward and are red.

Stockworm’s stock screeners provide a patent-pending, award-winning method for picking stocks according to the user’s personal investing preferences.

Stock screener results are presented as report cards, from the best to the worst, based on selected criteria. The report cards display vital information for each stock as well as links for more in-depth analyses.

“Our computer algorithms that run every night and post-process all the market data have done the decision making for you to decide what low and high are in the context of the current market,” he says.

The highest level tool on the Stockworm site is the Autoinvestor, which provides automated buy or sell recommendations on an individual user’s stock portfolio, Siegel says.

“Really, at this point, we’re almost doing everything but trading your stocks for you.” GT
Creative Analysis

Wonya Lucas blends love of engineering, entertainment into cable television career

By Maria M. Lameiras

As a student at Northside High School in Atlanta, Wonya Lucas knew her passions for drama and science would take her one of two places.

"At 18 how do you know what you want to do for the rest of your life? All I knew was I was either going to Broadway or I was going to be an engineer," says Lucas, IE 83. "I chose engineering because it offered flexibility. It gave me the opportunity to use math and science, which I loved, and also allowed me to be creative because creative problem solving is involved in engineering, as well as analytics."

Lucas has combined both worlds in a career that brings engineering skills to bear in the entertainment world. But her stage is in Atlanta, not New York.

In July, Lucas took over as executive vice president of marketing for The Weather Channel, where she manages marketing and branding for The Weather Channel Networks and weather.com. She came to The Weather Channel from CNN, where she was senior vice president of strategic marketing for CNN Domestic Networks. Before that Lucas was vice president of business operations/network strategy for Turner Broadcasting System and Turner Network Television and managed the long-range planning process for TBS, TNT, Turner Classic Movies and Turner South.

She considered pursuing an engineering degree at MIT.

"In my senior year of high school, I lost my father, who had a brain aneurysm. I had been accepted early to Georgia Tech and I decided to stay in Atlanta to be near my family."

Tech's solid reputation as an engineering school attracted her, Lucas says, and she was familiar with the campus. "I liked the school spirit I'd seen when I was there for science fairs as a high school student."

Still, that first semester in the fall of 1979 was overwhelming.

"The large classes, the quick pace, the impersonal feeling to an extent, it was overwhelming for me, as it is for most freshmen," Lucas recalls. "However, the experience was very positive for a number of reasons. It definitely was a challenge for me. It was not easy, but I had the sense of 'I'm going to finish, I'm going to do well.' It focused me and it taught me to have a goal and really, really pursue it with a vengeance."

As a student, Lucas worked in Engineering Dean William Sangster's office and with the Minority Introduction to Engineering Program, a summer offering at Tech that exposes minority high school students from around the country to engineering opportunities.

"I was involved in that program for two or three summers and just being able to shape kids' lives and 'preach the gospel' about engineering has turned into a commitment to young children and teaching them about engineering careers. It has been a lifelong thread throughout whatever I was doing," Lucas says.

After graduating, Lucas worked for Westinghouse Electric before earning an MBA at the University of Pennsylvania's Wharton School of Business in 1990.

Lucas spent a year with Clorox and then joined Coca-Cola in Atlanta in consumer and trade advertising, promotion and new product development. Three and a half years later, she made the career leap into the television and cable industry.

"I am a student of the media and I studied the industry and I loved television.
sion. Cable TV at that time was still really taking off. There were lots of new networks being formed and the technical side and the creative side of cable combined the passions I had for both the analytical and creative. It was perfect for me," Lucas says.

"I felt it was my destiny, that 'this is for me and I know it and one day they'll know it too.'" Lucas had spent a six-week unpaid internship at Turner Broadcasting and had formed a relationship with Julia Sprunt, corporate vice president for public relations, human resources and corporate resources for the media company. "She told me to call her if I ever wanted to come back, so I did," Lucas says. "That was the hardest job to get that I've ever had. It took a year and a half and about 30 interviews, but I persevered. It was not an easy transition, but I stuck with it. I felt it was my destiny, that 'this is for me and I know it and one day they'll know it too.'"

She joined Turner in 1994 as strategic marketing director of Turner Corporate Marketing and was later named vice president of marketing for TNT, responsible for the development of advertising campaigns, promotions and trade marketing for the TNT programming brands.

"It was an opportunity to work on developing brands and working on the identity of what these networks would become. I worked on creating awareness for original movies and series they were launching to create usage or viewership and my sales experience kicked in because a lot of it was knowing how to get advertisers to buy time on your network," Lucas says. "We had to do a lot of analyzing the industry and the strengths and weaknesses of ours and of our competitors. It was a very analytical approach to the creative process."

In September 2000, Lucas was named senior vice president of strategic marketing for domestic networks of the CNN News Group.

"CNN had no competition five or six years ago, but the last couple of years at CNN we were really analyzing the competition and developing the core of what CNN is, which is great journalism meets great TV," she says. "CNN is about journalism and trust. We were trying to develop creative ways to embody that."

Lucas made the decision to join The Weather Channel after being approached by network president Bill Burke, who was general manager of TBS while she was with TNT.

"He wanted a new team. He approached me about coming to The Weather Channel to fulfill his vision of evolving the Weather Channel brand," Lucas says. "It is a strong brand and when I looked at the brand and the audience, I knew there was so much work we can do that is relevant to people's lives."

Lucas says it was an opportunity to broaden her responsibilities from marketing and research to include public relations and affiliate marketing, on-air graphics and on-air promotions.

"It almost doubled my responsibility areas. To have the opportunity to be on the executive committee of the company was very compelling to me," she says. "One of the most important things for me, and this is why I went to Turner from Coke, is to work for an entrepreneurial company. I wanted to work at a smaller company where we could really make change and make a difference every day. I've taken risks and I haven't been afraid to take risks. I'm not afraid to buck the status quo and take calculated risks. That has always paid off for me.

"The people here are very passionate about The Weather Channel. They want to come to work and do good work and I love that. I like vision, I like to see where we are going and there are a lot of good things to do in the future. That gets me excited."

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**Red Tea and Rusks**

*Alumnus David Abrahams introduces South African foods to American palates*

By John Dunn

Alumnus David Abrahams is working to serve America red tea, a robust South African brew that is finding favor in both gourmet stores and mainstream supermarkets.

Abrahams, a native of South Africa and now a U.S. citizen, co-founded Atlanta-based Kalahari Limited in 1999 to market South African foods to American consumers.

He and partner Edward "Ned" Fitch began selling Kalahari Red Tea in May 2002, says Abrahams, ME 88, MS IE 92, chief executive officer of the firm. "We've done the next to impossible," Abrahams says. "Small companies getting shelf space in big chain supermarkets is unheard of — it's a very complex and expensive endeavor."

Kalahari was a $50,000 company when Publix agreed to give it shelf space with such leading brands as Lipton, Celestial Seasonings and Luzianne, he says. "It was huge. It really changed the fate of Kalahari forever, taking us mainstream."

Kalahari Red Tea is now in about 2,000 stores, including Publix, Bi-Lo, Bruno's, Giant Food and many gourmet and natural food stores. In addition to negotiating with Kroger, the company is working to expand its market to the West Coast.

The firm expects to do $2 million in revenue in 2003, Abraham says, estimating that December sales revenue was $100,000. "We basically came out of
nowhere," he says. "Every month we add more stores, the revenue goes up. The colder it gets, the more tea we sell. January and February are the best two months for tea sales."

Red Tea is an herbal brew made from the South African rooibos shrub, which grows only in the Cederberg Mountains in the Western Cape. It has a reddish-brown color and a full-flavored taste. Rooibos is an Afrikaans word, which is one of the South African dialects. It is pronounced "Roy-boss," and literally translates into red bush — rooi meaning red and bos meaning bush.

"It's caffeine free, high in antioxidants and has health properties on par with green tea, yet it has superb taste," Abrahams says.

"I know half the grocery managers in Atlanta personally. Kalahari Red Tea is like my baby. I go in there and count boxes on the shelf to see how it's doing," he laughs.

Abrahams says he and Fitch decided to start Kalahari while sitting around a kitchen table in 1998 enjoying a box of rusks, a South African biscotti-like bread. "In the past, Fitch sold exotic alligator meat to Disney World," Abrahams says. "I figured if Ned could sell alligator meat to Disney World, then he could sell rusks to supermarkets.

"Rusks are as much a part of South African culinary tradition as tortillas are in Mexico," he says. "Everybody eats rusks. When you go to somebody's house for tea in South Africa, you're going to get rusks. Specialty coffee shops were the rage in the late 1990s, and I thought rusks would be a great complement to coffee or tea."

It took three years to get Kalahari rusks into about 400 stores, including Publix.

"We found that the natural foods consumer is the one who would most identify with and appreciate the rusks products because they are a healthy snack. That type of consumer has a more open mind to upscale imported foods," he says.

Kalahari's success caught the attention of National Brands, one of South Africa's major tea manufacturers, which wanted to tap into the U.S. market. The tea company agreed to private label red tea for Kalahari.

"My Georgia Tech background has helped me be an exceptional learner," Abraham says. "I got an MBA in food marketing by trial and experience — doing this for the past three years. My technical skills have served us well, especially having the ability to be good with spreadsheets, to program html and handle our accounting. It has allowed us to appear much bigger than we really are."

Kalahari is going to be an umbrella brand for a variety of South African food products, Abrahams says.

"We started out with the rusks, then we came in with the tea, which has been a huge hit," Abrahams says. Next year the company plans to introduce a unique South African-style beef jerky called Biltong that, instead of being smoked and dried, is cured in vinegar and spices.

"Many South African foods started out as explorer foods because the Dutch and Portuguese explorers who sailed the spice trade routes in the 1600s would stop at the cape in South Africa. These foods were hard tack for their navies."

Abrahams is hoping the old world foods will be every bit as satisfying to new world tastes.
When Mother Nature is at her worst, John Cortinas is at his best.

Cortinas, PhD GeoS 92, studies storms. His specialty is the worst winter weather — ice storms and blizzards.

John V. Cortinas Jr. is a research meteorologist and assistant director of the Cooperative Institute for Mesoscale Meteorological Studies and adjunct professor in the School of Meteorology at the University of Oklahoma.

Mesoscale is a size category referring to a weather phenomenon that's on the order of something as big as, say, the state of Iowa, Cortinas says. "Storms are exciting," he says, "not because something devastating is happening, but because something in the atmosphere is happening that's extraordinary."

Cortinas works in conjunction with the National Severe Storms Laboratory in Norman, Okla., aka Weather Central USA.

"We hope the research we do will lead to improvements in forecasts that, once translated to the public, will be accurate," says Cortinas, who grew up in Nebraska and is no stranger to weather extremes. "There are still a lot of unknowns about what causes winter storms and, therefore, how to predict them."

In 2002, Hispanic Engineer & Information Technology magazine named Cortinas one of "The Nation's Hispanic Power Hitters," an honor he says surprised him.

"These men and women are leaders in a wide variety of professions, but they share common roots and have faced many of the same social, financial and language difficulties to overcome hardship, stereotypes and, sometimes, outright bias," the article says. "They demonstrate the simple truth of the adage that hard work may not guarantee success, but it is a requirement for success."

Cortinas regards the accolade as "very valuable in terms of exposure — understanding that anyone can succeed, that anyone can aspire to be whatever they want to be."

"It is important for people to see..."
such role models — people who have been successful in their careers. Minority groups don’t always see that. It’s not that they wouldn’t feel they could get to that level, but they may feel it’s more difficult.”

That’s even more true for scientists, says Cortinas, whose father is Mexican-American, “because there are even fewer minority scientists. So when someone sees other minority scientists, it provides potential mentors.”

Cortinas sets aside time for mentoring undergraduate students through two organizations, the Society for Advancement of Chicanos and Native Americans in Science and the American Meteorological Society.

“I give them career advice, advice about what classes to take, opportunities available in the field. I advise them on research projects,” Cortinas says, acknowledging that he probably gets as much from mentoring as the students he mentors. He also lectures in the Oklahoma school system on meteorology and careers in sciences.

Cortinas traces his interest in meteorology to an eighth grade science teacher. “We had elective courses, and one of them was meteorology. The teacher was a pilot so she had a pretty good appreciation of weather and a good understanding of it. Going into the class I didn’t think I’d be that interested, but it was partly her dynamic teaching style and her enthusiasm that I think I got a piece of.

“From then on, I thought that’s what I wanted to do,” he says.

Cortinas focused on severe thunderstorms while at Georgia Tech.

“Studying severe weather is a way of learning to use various research tools. The atmosphere works the same whether it’s within one storm or another, and understanding how the atmosphere works is critical and is always incorporated into any kind of work that you do.”

Despite his professional penchant for storms and icy winter conditions, Cortinas likes to spend leisure time playing play tennis and traveling — to warm climates. GT
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**Collectibles**

I am a Georgia Tech Alumnus (ChE 1973) and active Scoutmaster in the Blue Ridge Council BSA with headquarters in Greenville SC.

I need memorabilia of any kind related to the Scouting Movement in the United States and around the world to display as a means of teaching the history of Scouting to the youth of our local and regional community.

If you have any historical Scouting items please contact me as I would be interested in talking with you about either a tax-deductible donation or a cash purchase of these items.

Thank you for your consideration.

Russell Smart (ChE 1973)
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Organic chemistry professor Katherine Seley’s research deals with finding the most direct path to treating disease, but her own route to the career she loves took twists she never anticipated.

As a 15-year-old in Erie, Pa., Seley was taking college courses and doing genetics research at local Gannon University while still in high school. After graduating, she enrolled at Penn State University to study genetics but, after only a year, Seley dropped out to follow her then-fiancé when he was transferred with his job. The couple married and had two daughters, but Seley felt that by leaving her education unfinished, she had set aside an untapped potential within herself.

Between the births of Tristan in 1980 and Alexandra “Ali” in 1984, Seley began taking classes at St. Petersburg Junior College in Florida, where she met two organic chemistry teachers who changed the course of her life.

“It was incredible because in high school I had a terrible teacher and really disliked chemistry but, suddenly, it was like a light bulb went off. I realized that I really liked organic chemistry and that I was actually good at it,” says Seley, who earned her associate’s degree in chemistry from the college in 1983.

She went on to earn her bachelor’s degree in chemistry from the University of South Florida in 1992 and began work on her doctorate under Stewart W. Schneller, chair of the chemistry department at the time.

“My older daughter was very involved in fast-pitch softball at the time, even on the national level, and we spent a lot of time on the ball field. I remember taking my books out with me to study because we were doing so much traveling to games,” Seley says. “I was very determined to earn my degree. I was always driven, but once I got started, I began to realize just how important it was for me and my daughters that I finish.”

In 1995, Schneller took the position of dean of the college of science and mathematics at Auburn University. Seley transferred to Auburn to complete her degree under her mentor and commuted from Tampa to Auburn, Ala., once a month.

Seley went to Schneller for guidance on the direction her career should take.

“I asked him if I should focus on industry or academia and he just smiled and said, ‘You’ll know.’ That really made me mad! I wanted him to tell me which direction I should focus on, but he wouldn’t,” Seley says. “But not too long after that I remember...
teaching my first class and it was like a lightning bolt. After I finished teaching the class I went by his office and I grinned at him and said, 'I know.' He just smiled and said, 'I knew you would.' He always knew I was headed for academia, but he wanted me to discover this for myself.”

After she earned her doctorate in 1996, Seley became a postdoctoral fellow, and stayed on to run her mentor’s research group in medicinal chemistry. About the same time, her marriage ended, and she stayed on in Auburn for two years doing research but also opting to serve as a visiting assistant professor of chemistry at Auburn so she could teach. In 1998, Seley joined Tech’s School of Chemistry and Biochemistry as an assistant professor.

“It is a very exciting and dynamic department and I was intrigued by the department’s potential with regard to the collaboration opportunities with Emory and the multidisciplinary aspect of the new Bioengineering and Bioscience building,” she says.

Seley is involved in such initiatives as anti-cancer and anti-viral research, drug design and the prevention of bio-terrorism.

Funded by the National Institutes of Health, Seley’s research involves the design and synthesis of anti-cancer, anti-viral and anti-parasitic medicinal agents that have the potential to disrupt DNA methylation. By interrupting DNA methylation with these compounds, Seley says she and her colleagues hope to induce tumor cells to differentiate into non-malignant cells. Inhibiting methylation could potentially cause cancer cells to stop replicating altogether, stopping tumor growth and spread.

“Cancer cells rapidly reproduce. We are trying to see if we can get them to replicate into a normal cell or, alternatively, to halt their growth completely.”

Seley’s second major research thrust, and one that is garnering international attention, involves designing a new class of compounds called “fleximers” as a tool for drug design. The initiative came about through Seley’s desire to increase the reliability of computer-assisted, structure-based drug design by developing a series of bioprobes that introduce flexibility into molecular modeling, therefore attaining better and faster results and making effective drug design less haphazard.

In September, Seley was invited to speak at the 15th International Roundtable on Nucleosides, Nucleotides and Nucleic acids in Leuven, Belgium.

“This approach has the potential to really help not only us in our research, but others as well. Most people who are using molecular modeling in drug design know they can’t trust the data. Our initial results have shown that this approach allows us to accurately predict the binding energies for potential enzyme inhibitors, because the theoretical and observed data we have obtained is very close and it clearly lends confidence to the method,” Seley says.

In addition to funding from the NIH, Seley has also received funding from the American Cancer Society, the Emory/Georgia Tech Biomedical Technology Collaborative Research Program and the Emory/Medical College of Georgia Biomedical Technology Collaborative Research Program.

Seley also is involved in biodefense and has funding from the U.S. Department of Defense for this work. Last summer, Seley traveled to Russia with the defense department’s Cooperative Biodefense Research Program to investigate smallpox and other infectious diseases considered to be potential bioterroristic threats. She is slated to visit Russia twice in 2003.

This past spring, Seley was named the 2002 Class of 1940 W. Howard Ector Outstanding Teacher of the Year at Tech. She says it is gratifying not only to watch students grasp the concepts she teaches, but to impart the love of chemistry to others.

“I am always amazed by the number of people who say they hated chemistry when they were in school. To me it was always fun. I want to turn people on to how exciting and interesting chemistry truly can be and that it is definitely not as scary as it seems,” she says.

Mentoring is also an important part of her teaching. Seley has four undergraduate students and eight PhD students working in her research group, as well as a Gwinnett County high school student who is interested in pursuing chemistry at Tech.

“Training students — being able to mold and shape and guide future chemists — is extremely important,” Seley says. “But you have to be excited about what you’re doing. If you can’t get that enthusiasm about your field across to your students, why should they be interested in it? I love what I do and I love teaching, no matter whether it is in the classroom or in the laboratory.”

The Seley File

- **Born:** May 24, 1958, DeRidder, La.
- **Education:** Associate degree in Chemistry, St. Petersburg Junior College, 1983; BA in Chemistry, University of South Florida, 1992; PhD in Chemistry, 1996, Auburn University.
- **Honors/Achievements:** Class of 1940 W. Howard Ector Outstanding Teacher Award, 2002; Outstanding Faculty Award; Cardinal Key Honor Society, Auburn University, 1998.
- **Personal:** Two daughters, Tristan, 23, and Alexandra “Ali,” 18; “significant other,” Mike Radtke, scientific review officer for the National Institutes of Health, three dogs, four cats.
- **Leisure Interests:** Gourmet cooking and fine wine, rose gardening, animals, golf and travel.
Hot Performer

Senior David Stevenson, a member of the Georgia Tech Pep Band, finds the library fountain an ideal place to cool his heels after performing on a warm afternoon during Family Weekend.
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