GEORGIA TECH

Alumni Magazine ■ SPRING 1989

TECH AIDS RESURGENCE OF THE U.S. TEXTILE INDUSTRY

Also Inside

■ Desktop Publishing
■ Who Killed Keynes?
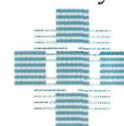■ An Interview with Dow Chemical's CEO

GEORGIA TECH

VOL. 64 NO. 4 **_Alumni Magazine_** Spring 1989

STAFF

John C. Dunn
Editor

Gary Goettling
Associate Editor

Gary Meek
Margaret Barrett
Photography

Everett Hullum
Design

Wayne Parker
Advertising
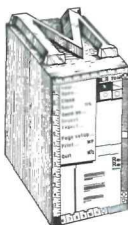
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    chairman
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On the Cover
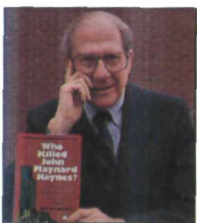
Once pronounced dead, the Southeast's textile industry
is being resuscitated by automation and computeriza-
tion. The revival offers opportunities for Tech's School
of Textile Engineering. See story, page 23. Inset photo
by Gary Meek; background photo of the Georgia Tech
School of Textile Engineering, taken in 1918.

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A World Beyond T-Squares and Computers

Editor:
I want to comment on the letter from Mr. George Stewart ["Tell Us What You Think," *Georgia Tech Alumni Magazine*, Winter 1989] and the magazine's proposed new direction.

I am not an engineer and I am not a graduate of Tech; however, I have worked in the engineering community for eight years and am married to a Tech CE graduate. Although technology is, of course, the main focus of most graduates' professional lives, it is also something readily available in their day-to-day routines through trade publications, interaction with colleagues, conferences and many other areas. The "challenge of managing technology" is something of a *cause celebre* in all sorts of business and technical journals.

I believe the best thing that your magazine does is bring information to alumni about the world beyond their professions. Last issue, your best articles were on the Mad Housers and black economics. These types of articles won't be found in the *Harvard Business Review*, computer magazines, or any ASCE, ASHRAE or AWWA publication.

The human interest and political stories in your magazine are very important to our graduates. It reminds them that there is a world beyond their drawing boards and computer terminals and that they have a responsibility to that world.

I hope you continue to run stories like the ones in the last issue, and I urge you not to change your direction too much.

Amelia Gambino
Georgia Tech Office of Publications
Atlanta

Humans and the Work Environment

Editor:
The request for thoughts regarding technology ["Tell Us What You Think," Winter 1989] brings to mind a technology that most folks are not aware of: human performance technology.

Since the 1960s, a small group of associates who studied under Dr. B.F. Skinner have created and implemented this technology in major organizations and companies.

This technology employs an engineering model to diagnose human performance deficiencies in the work environment and to recommend cost-effective solutions.

Within the realm of human performance tech-nology, three subsets are considered: instructional technology, environmental re-engineering, and re-alignment of motivational and incentive systems.

The instructional tech-nology subset has been the most developed. This field provides a rigorous model to identify exactly what needs to be taught to workers, and how to identify learning problems and prescribe effective teaching tactics.

In association with Dr. Joe Harless, a pioneer in this area, our company delivers this technology to many Fortune 100 compa-nies, the military and other organizations.

David Schiff, BIOL '64
The Operant Group Inc.
Atlanta

Not Earth-Shaking, But Some Progress

Editor:
The article "Fax of Life" [Winter 1989] was interest-ing but not earth-shaking. The piece about the com-puter virus was a waste of paper. We've been reading about this subject for a year. Who needs more? The Mad Housers article was great, and "Economics and the Black Underclass" was interesting reading.

It's a shame that there was zero on sports and such happenings at Tech.

Anyway, the *Georgia Tech Alumni Magazine* is improving. At least I did read it this time, to your credit.

H. Speer Ezzard, ME '50
Marietta, Ohio

Don't Forget Discovery Place

Editor:
I know that the citizens of Atlanta are excited about SciTrek. They should be, considering the impact such a facility has on the educational and economic qualities of an area.

I was, however, dis-turbed when I read in the *Georgia Tech Alumni Magazine* ["The Excite-ment of SciTrek," Winter 1989] the claim of SciTrek being "the largest of its kind in the Southeast." Atlanta's facility is approxi-mately 40,000 square feet. Discovery Place in Char-lotte, which opened in 1981 and is one of the top ten hands-on science and technology museums in the country, exceeds 130,000 square feet.

At any rate, I commend the Georgia Tech Alumni Association for its support of the new educational facility.

Michael E. Blanton
marketing/public relations manager
Discovery Place
Charlotte, N.C.

Restructuring Tech: *Plans Gain Momentum*

Proposals for restructuring Georgia Tech academic programs are moving steadily toward completion, with a final report to the faculty due about the middle of May, according to Dr. Michael E. Thomas, who coordinates the committees involved in the work.

Thomas, director of the School of Industrial and Systems Engineering, said that all four major committee reports are at or nearing the first-draft stage, but added that many specific issues remain to be resolved.

The restructuring is being deliberated by four major committees comprised of faculty, alumni and students, reflecting the four broad areas of attention. Several subcommittees and study groups deal with specific issues.

Overall, **Thomas said** that he is pleased with the effort. "I think that the process is beneficial and has caused people in many elements of the university to look at what they are doing in the educational programs," he said.

"There is a better sense of community, and I think that will carry forward for a long time."

Thomas added that he has been impressed with alumni interest in the

Thomas: *Restructuring promises "enhancements to educational opportunities at Tech."*

process. "Their support has been overwhelmingly

positive," he said. "Several have been actively involved in committees. They feel strongly that this proposal will be good for Tech."

Thomas said that recommendations for a number of new graduate programs, and as many as 10 new undergraduate programs, may emerge from the committees' final reports.

"There will be a new program in discrete mathematics," he said. "There will be a new program in the history of technology,

probably. There will be a new program in technical communications of some sort. There are discussions underway about things like biochemistry between the biology and the chemistry schools."

"Those sorts of things on the educational scene are going to be enhancements to the educational opportunities at Georgia Tech."

Any change in the academic organization of Georgia Tech would have to win approval from the faculty and the Board of Regents, Thomas noted.

President **John P. Cre**cine first proposed reorganizing Tech's academic programs in August 1988. His outline called for three new colleges and a new division.

Colleges of science, computer and cognitive science, and an unnamed "new" college would be formed from existing programs in the colleges of management and science and liberal studies, along with new offerings. The new division would include music, theater and campus-wide lectures.

In his original proposition, Crecine targeted the fall quarter of this year for implementation of the new academic configuration.

Tech Publications Honored by CASE

Georgia Tech received 10 awards in the District III communications and media awards program of the Council for the Advancement and Support of Education. The recipients were announced at CASE's annual District III conference in Nashville Feb. 12-15.

Alumni publications garnered six of the awards. *Tech Topics* received Grand Awards in both the tabloid publishing category and the periodicals improvement category. The *Georgia Tech Alumni Magazine* was presented an Award of Excellence, and also captured three Special Merit Awards for editorial design.

The Georgia Tech News Bureau was recognized with a Special Merit Award for the *Whistle*, the Institute newspaper, and an Award of Excellence for the bureau's role in the 1988 Democratic Convention.

A pair of Award of Excellence honors went to the Research Communications Office for the *1988 Georgia Tech Research Institute Annual Report* and its photography of "Molecular Beam Epitaxy — Advanced Microelectronics Equipment."

Play It Again, Machine

Chugga-chugga-chugga-chugga-GLOP-chugga-chugga-chugga...

Sudden changes in background noise often serve as a warning that something is wrong. Drivers ignore normal engine sounds until a new thump or unusual rumble develops. Parents of young children sleep soundly through normal background noise, but awaken immediately at the sound of a baby's cry.

Georgia Tech researchers believe human operators could more effectively manage complex equipment such as nuclear power plants or fighter aircraft if critical information were presented through changes in background sound. Experiments at Tech have shown that human operators can learn to monitor complex variables through sound alone.

Using the ears as well as the eyes to receive information would be valuable for many applications in industry, space and defense. Sound might be used to represent the threat environment for fighter pilots, or to lessen a pilot's workload by reducing the number of dials and gauges to watch.

"Aircraft pilots must constantly monitor a lot of visual information," says Dennis Folds, a researcher in Tech's Human Performance Branch. "To compensate for people's difficulties in processing this information rapidly, we're trying to switch some of this visual information to an auditory channel."

Bubbles in the Belfry?

Researchers at Georgia Tech have developed a tiny, hollow sphere that may provide an alternative to existing industrial and home insulation materials.

By using a rapid, liquid forming process, Dr. Joe K. Cochran has designed a thin-shelled ceramic sphere, dubbed "aerosphere," that is lightweight, durable and capable of withstanding temperatures up to 3,200 degrees Farenheit.

Cochran, an associate professor of materials engineering, says that the

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Tech Scientist Develops New Insulation

spheres are as strong as existing industrial insulation, but do not crack or shrink with age, and may offer superior insulation.

The first aerospheres were made of aluminum oxide, a substance widely used in fiber form as an insulator in high-temperature environments such as steel plants.

Experiments have also been conducted with spheres made of Mullite and glass.

An economical chemical production method called
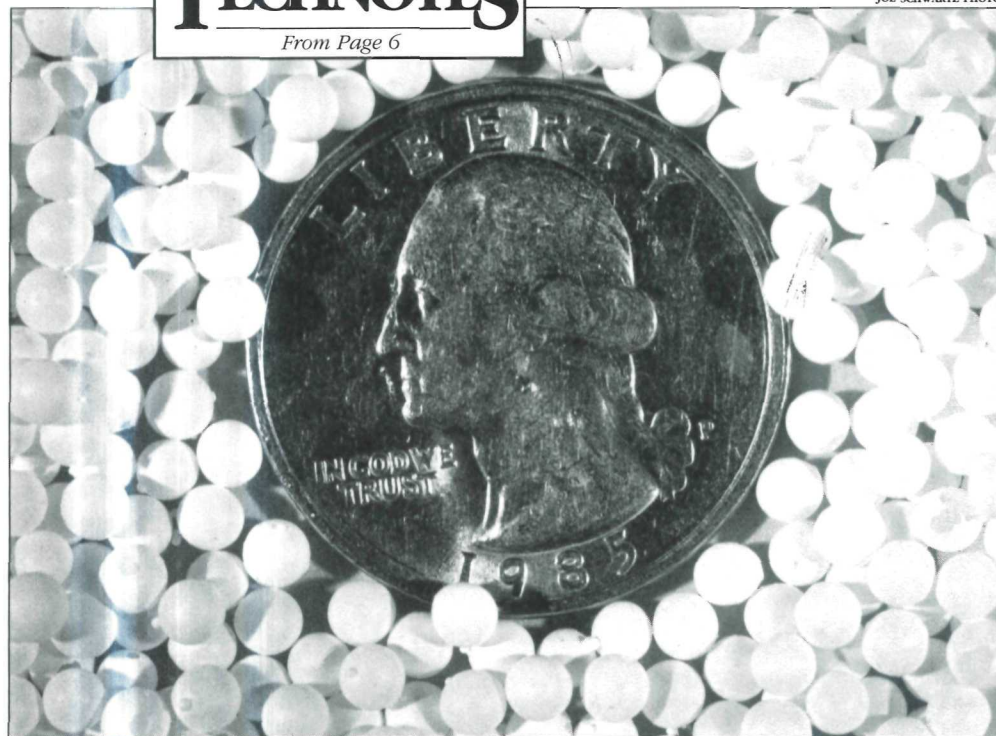
Although expensive to produce, aerospheres last longer than conventional materials and offer long-term savings through reduced energy costs.

slurry processing may someday enable aerospheres to compete in price with fiberglass, Cochran says. He and several colleagues have formed a company, Ceramic Fillers Inc., to help develop and market the invention.

Skydiving off the Edge of Space

At first glance, Russell Fish seems to have done it all in his world-class mastery of skydiving, but he says there is still something important to prove.

The 1974 electrical engineering graduate, who set a world record for the number of parachute jumps in a 24-hour period ["Alumnus Reaches for the Sky and Dives into the Record Book," *Tech Topics*, April/May 1988] may attempt a feat that many people have said is impossible. Fish, along with skydiving partner Cheryl Stearns, is considering a

jump from the edge of space—some 26 miles out.

"The subject of extremely high altitude freefall has taken on great significance following the destruction of the *Challenger* and revelations that the crew survived the initial trauma," Fish says.

NASA does not believe that high altitude freefall is survivable, according to Fish, so its shuttle escape system is adequate for altitudes only up to 25,000 feet. Fish thinks that more can be done. He believes that a successful high altitude freefall is possible,

and he hopes to prove it with the expectation that NASA would then augment the shuttle escape procedures and equipment to make them safer.

Fish emphasizes that he is not committed to make the jump from space, and is now only "seriously considering" the possibility

While there are obvious technological considerations, such as the means of ascent and the right kind of pressure suit, there is still much to be researched before a jump would be organized. Fish points out that data on high altitude

freefall is limited to only two previous experiences, one "classified."

"My expertise is more Ohm's Law than laminar flow," says Fish, "so I would appreciate some input from Tech grads on some of the technical problems. We are concerned about maintaining stability in the thin atmosphere above 100,000 feet, as well as transonic effects."

Alumni are invited to contact Fish in care of Post Technologies Inc., 15260 Church Avenue, Kerman, Calif. 93630; (415) 968-8041, fax (415) 968-0794.

Give the Hotline a Buzz

Keeping up with what's happening at Georgia Tech is a lot easier with the Alumni Association's new "Buzz Hotline." By dialing (404) 853-9999, alumni can hear a recorded calendar of upcoming sports events, Georgia Tech club meetings and other activities of special interest. The recording, a concept of the Alumni Association's Committee of Twenty, is available 24 hours a day.
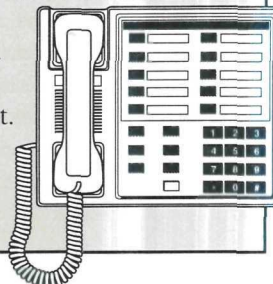
Tech Maintains Position In Competition for Scholars

Georgia Tech has retained its top ten ranking among all universities in the number of its National Merit Scholars and National Achievement Scholars enrolling for the 1988-89.

Tech's freshman class contains 121 National Merit Scholars, or 6.7 percent of the entire class, which positions Tech in seventh place among all universities and in first place among all public institutions on a per capita basis.

The number of entering National Achievement Scholars, 17, places the Institute in tenth place nationally, tied with Howard University and the University of Illinois. On a percentage basis, Tech occupies the No. 2 spot among public universities.

National Merit and National Achievement scholars are selected on academic distinction, extracurricular accomplishments and personal qualities. ■
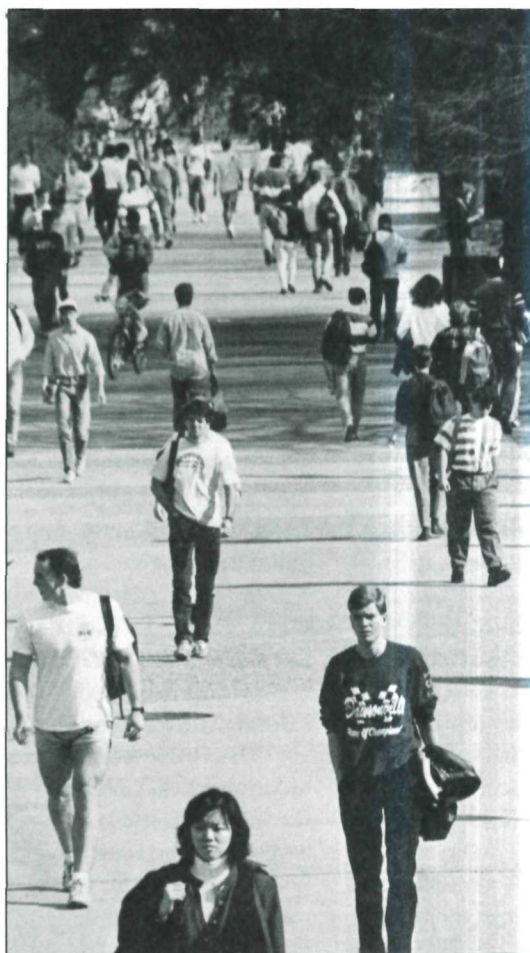
Tech's 121 new Merit scholars represent about seven percent of the freshman class.

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Businessland and Apple Computer are proud sponsors of the Georgia Tech Alumni Association. And Businessland is pleased to make a special offer on Apple Macintosh computers to Georgia Tech alumni. **30% off.** Several sample systems are featured below. Call **Laura Calhoun** at 404-231-1068, Businessland's Buckhead center. If you're in Georgia, she'll help you to select your system. Or if you're out of state, she'll put you in touch with your local Businessland representative. Limit one system per alumnus.

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- 1 MB of RAM
- 40MB hard disk
- Extended Keyboard
- HyperCard included
- Regular price **$5098**
- Savings of **$1529**

Macintosh IIx

- Motorola 68030 microprocessor
- one 1.4MB disk drive
- 4MB of RAM
- 80MB hard disk
- Extended Keyboard
- Apple color monitor
- Extended video card
- HyperCard included
- Regular price **$9746**
- Savings of **$2923**

Macintosh SE $2309
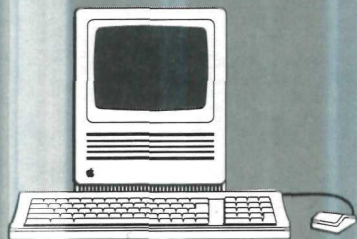
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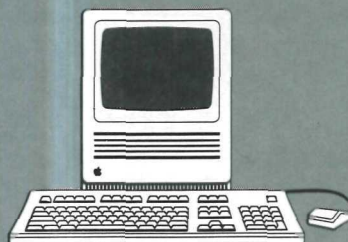
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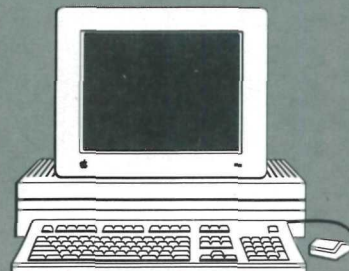
The Art of Publishing in

the Hands of Everyone

Written by Lisa Crowe
Photographed by Gary Meek

E vidence of the craze for desktop publishing is everywhere. Just look at that offbeat newsletter that came in the mail or the flyer that was stuck under the windshield wiper of your car. Does it contain 15 or so styles of type and a bizarre display of zapped up clashing graphics?

It could only be the product of an amateur desktop publisher.

"It looks crazy, but you know someone had a good time with it," says Michael Baxter, an editor for the University System of Georgia and a subdued desktop publisher himself. "It [desktop publishing] makes a designer out of everyone."

Desktop publishing entered the market only four years ago, yet it has revolutionized the way that American businesses print their tons of paperwork. Companies of all sizes are producing forms, brochures and glossy magazines in-house, and as technology improves, desktop publishing is fast becoming the business norm.

It's a trend that's easy to understand when you compare desktop publishing with traditional publication methods. In the old days, if your company needed a new brochure, your secretary typed up your prose and sent it down to a typographer. He selected and set the type, and sent back a slick proof that showed your

At Church Street Type, one of the new breed of typesetting service bureaus, Kate Sederholm studies a layout for the GEORGIA TECH ALUMNI MAGAZINE on a Mac II. Used by a skilled craftsperson and coupled with a Linotronic 300, the Mac II can deliver the highest quality professional typesetting.

Georgia Tech Alumni Magazine joins the desktop publishing revolution

The key: equipment plus skill

prose in print. If there were no changes, "galleys" were delivered to a designer who cut out the print, pasted it on a layout board and threw in a few colorful flourishes.

When you got the art board back and were horrified by the abstract design that was scrawled across the front of your brochure, you went to the designer's office and sat with him until he worked out something you both could live with. The layout board was then taken to a printer where, if you were lucky, the pieces stayed mounted on the art board long enough for a good print negative to be shot. The whole production process could take weeks or even months if your typographer or designer had conflicting deadlines.

Using desktop publishing, the typography and design for a brochure can be worked out on a computer. Graphics can be added by freehand computer drawing or by simply transferring a hard copy design onto the screen using a scanner. Once the information is in the system, it can be cleaned up, enlarged and

At the other end of the spectrum, if you buy a top-of-the-line computer, a large screen monitor, color and black-and-white laser printers, various accessories and a generous supply of software, you could spend over $60,000, according to Larry Nichols, a sales consultant for Connecting Point, an Atlanta computer store.

Many companies find their production savings to be well worth the cost of the equipment. The Atlanta-based Citizens and Southern Corp. bought a desktop publishing system when the concept first came on the market, and has added increasingly sophisticated equipment every year. The corporation now publishes its own annual reports, quarterly reports, monthly magazines, newsletters and employee bulletins.

"Our last desktop publishing system justified its expense with the typography savings on just one quarterly report," says Peter Davis, manager of internal communications for C&S.

Time, even more than money, was an important reason why C&S brought its publications in-house, Davis says. Because the work is on a computer, it's simple to incorporate dozens of last minute publication changes.

It sounds ideal, but contrary to much of the sales hype, a desktop publishing system will not produce an

ALDUS CORP. PHOTO

Desktop publishing is not only efficient, it's cheap. Today, a basic system can cost as little as $5,000.

More sophisticated programs allow you to automatically wrap text around graphics— as was done here.

juggled around. You play around with it and print a final copy on a laser printer.

For an even more professional appearance, your copy is then taken — via computer disk — to one of the growing number of desktop publishing service bureaus with high-capability equipment. For a minimal expense, a "camera-ready" copy is run off in minutes. From concept to completion, your brochure, instead of taking weeks, may take only half-a-day.

Desktop publishing is not only efficient — it's cheap. A basic desktop publishing system can be put together for as little as $5,000. You won't be publishing annual reports, but you will be able to put together a simple newsletter that can be printed up on a service bureau printer.

attractive glossy magazine all by itself. Davis's department is staffed with a full-time designer, and an editor who understands typography

More and more materials production for Georgia Tech Alumni Association is done on desktop publishing equipment. Beth Bates of the programs department and Gary Goettling, associate editor of the magazine, look over a new Mac II. An Apple computer, the Mac provides easy interface with the Linotronic 300, a professional typesetter that produces exacting, industry-standard "cold type" at speeds unimaginable even a decade ago. The alumni magazine is produced on the Mac.

A simply complicated process

and design. Even so, the company hires an outside designer to produce a cut-and-paste layout of their annual report.

Under the theory that a desktop publishing system miraculously does it all, the responsibility for putting out an in-house document is often shifted onto an overburdened employee who has no interest in design.

"Desktop publishing gives you more control, but you still have to physically lay it out and design it," explains Rachel Maloney, a part-owner of Church Street Type and Publishing, a Decatur, Ga., typesetting, design and service

On the "desktop"
—the computer
screen—you can
display a number
of "windows" that
reveal the applica-
tions you're using.

> **The software is only as good as the person using it. That's why you end up with a lot of trashy brochures.**

bureau firm that uses desktop publishing equipment. She is also the owner of Maloney Graphic Design.

"The computer is only as good as the person using it," Maloney says. "When it first came out, people said, 'Great, I can put out my own newsletter.' What you end up seeing is a lot of trashy brochures and newsletters."

When purchasing a desktop publishing system there are hundreds of details to consider, including who is going to operate it, but the basics are simple. In the world of desktop publishing hardware, there is Apple Desktop Publishing equipment and then there is everything else.

Apple initiated desktop publishing back in 1985 with a whole new concept in computers. Instead of typing in a code to communicate with the system, the operator moved a device deceptively called a "mouse" around his desk to manipulate pictorial images on the monitor screen. With Apple's new Macintosh systems, the user could move both print and graphics around on the screen for the first time and actually see what the printed page would look like.

The development of the laser printer allowed

that computer layout to be printed exactly as it was on the screen.

For people who don't type or who were frustrated with memorizing code, the Macintosh systems were an instant hit. You want to delete a file?

It's simple.

Instead of carefully typing in a series of letters, by using the mouse you move a box with the name of your file on it and dump it in a cartoonish-looking trash can. Both functions and text names are displayed in windows on the screen and work the same way in the same place, no matter what software is being used.

"Since there is a high degree of uniformity among all programs and the commands are always on the screen, the user can master as many as 10 different software programs," says Hank Holmes, general manager of Phoenix Data Systems, an Atlanta company that specializes in systems integration.

User-friendly software is crucial in desktop publishing, since preparing a publication can easily require up to three programs. It usually takes a word processing program to get the text into the system, then a page layout program for typography and design, and finally a graphics program to incorporate and refine the art work.

Although Apple was the first to develop the concept, it's by no means the only player in desktop publishing. Most traditional DOS system hardware and software companies have entered the fray by devising their own mouse, laser printer and desktop publishing software. After all, they have a captive market of businesses that have spent a decade stocking up on DOS-oriented hardware.

"A lot of the development being done and the announcements being made are for IBM compatibles," Holmes says. "People want to plug desktop publishing into their equipment and go. All major Macintosh players are adjusting their programs for IBM compatibles, and most well-known packages that started on Macs are coming over to IBM compatibles."

Prescription for communications

Although they are frantically trying to make their DOS systems as Macintosh-like as possible, DOS-oriented players are not there yet, industry observers say. They are doing more with mouses and pictorial windows and symbols, but

Macintosh — it's easier to use. If you already have DOS equipment and you want to do primarily page layout, go with the DOS system."

In the graphics arena, Macintosh is still well ahead of its DOS competitors.

CLARIS CORP. PHOTO
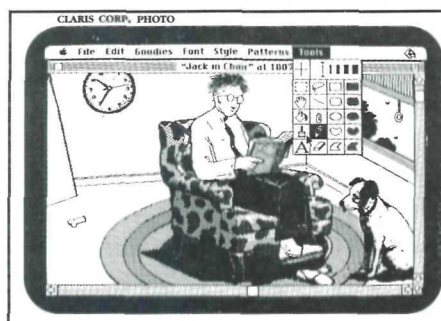
Computer training may soon become just another standard corporate expense — like pens and pads

Some programs are capable of displaying elaborate graphics, either bought as "clip-art" software or brought into the computer through use of a scanner.

"The clear-cut choice for doing graphics is the Mac," Nichols says. "It's just more up-to-date."

The major problem of adapting DOS systems to the pictorial Macintosh concept is the main chips of the IBM compatible systems. "They don't lend themselves well to graphic representations and it's always

DOS systems are still primarily text oriented.

"IBM compatibles have always been based on text and it's just not as user friendly," Holmes says. "You can run a few programs, but it's hard to keep up with more than that."

Although not a "Mac evangelist," Connecting Point's Nichols notes that "If someone walked in with zero equipment, I would recommend a

been a problem," Holmes says. "All the graphics are now done by software trickery."

This could change with the OS/2, a pictorial, Macintosh-like operating system that is being developed as an alternative to both Macintosh and DOS systems *(see story, page 52)*. The problem with applying OS/2 to DOS systems has always been that it demands too

Tech's Desktop: A Type in Time

The GEORGIA TECH ALUMNI MAGAZINE is itself is a good example of what desktop publishing can do. The last four issues, as well as the past three issues of *Tech Topics*, have been produced with a Macintosh II, Pagemaker and Microsoft Word.

The most precious resource of every publication is time, wherein lies the real beauty of desktop publishing technology. At a small operation like alumni publications, with a full-time staff of two, desktop publishing offers better management of time involved in production.

The production process involves interaction among writers, editors, typesetter

and designer. Previously, each of those functions was separate and specialized, so every single line of copy, down to the smallest correction, was involved in a time-consuming loop. Now, with production integrated into a computerized system, information transfer is measured in seconds instead of hours or days. Corrections can be made at the last minute. Less time is spent with minutia and more time is available for articles and editorial direction.

The time savings have also allowed more attention to be focused on improving the design and developing a consistent layout for the magazine.

While desktop publishing software has made the design task easier and opened many new creative possibilities, it is still only a tool that must be guided by an experienced designer.

In the case of the GEORGIA TECH ALUMNI MAGAZINE, designer Everett Hullum deserves credit for its splashy new look.

Changes in the alumni magazine have not gone unnoticed. For example, District III of the Council for the Advancement and Support of Education has recognized the publication with an Award of Excellence for improvement, and a trio of Special Merit Awards for editorial design. ■

success: Always think "desktop"?

much memory for personal computer users.

However, now that memory is becoming cheaper and more accessible to PC's, DOS systems could conceivably start to operate OS/2. "It's the operating system of the '90s," Holmes thinks. "I would say that when this operating system becomes really prevalent and when the memory is available, you will see a lot of Macintosh-like environments on IBM compatibles."

As **desktop publishing evolves** and becomes even more widely used, experts warn businesses to anticipate the time and expense of training. For Church Street's Maloney, learning desktop publishing was a memorable ordeal. "I sat at that computer for four weeks, 12 hours a day, seven days a week," she recalls.

Training can range from being left alone in a room with the computer manual to formal instruction with a consultant. Considering that any aspiring desktop publisher must learn at least the rudiments of typography and design, training can be costly with prices ranging up to $1,500 per day for a group to over $300 per day for individual sessions. Computer dealers, a fast growing number of training centers, and private consultants are all possible sources for desktop publishing education.

Training may soon become just another standard corporate expense — like pens and message pads — if desktop publishing keeps growing and evolving at the frantic rate that industry observers predict. Soon even business memos and letters will be expected to tastefully incorporate graphics and multiple typefaces, according to Holmes.

"It's going to keep developing until you expect every letter coming in to look like it was professionally printed," Holmes says. "Now when I get a hand-written letter, I think it looks unprofessional. In a few years when you see a letter that has been typed on a typewriter, you'll notice how clunky it looks." ∎

A DEGREE FROM TECH CAN OPEN A LOT OF DOORS.

THE RITZ

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WRITTEN BY JOHN TOON
PHOTOGRAPHED BY GARY MEEK
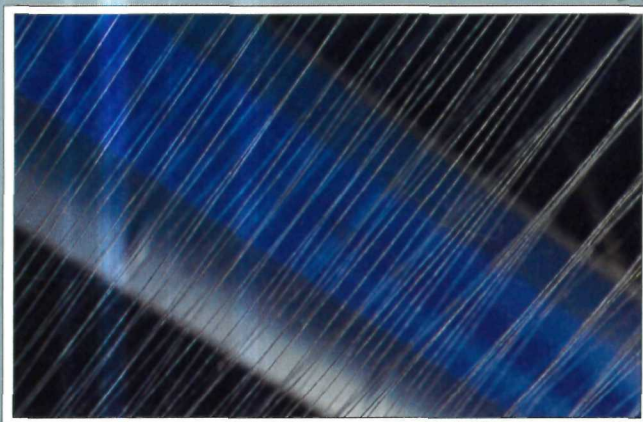
WEAVING TOMORROW

Georgia Tech researchers are exploring new applications for textiles, as well as improving conventional processes.

Amid clouds of swirling steam, a process control computer glows with flashing numbers that show fabric speed, chemical concentrations and dye vat temperature. If the temperature drops below limits, the computer instantly applies more heat. If chemical sensors show dye bath concentrations slipping off target, the computer opens

REPORTS OF ITS DEMISE GREATLY EXAGGERATED, GEORGIA'S TEXTILE INDUSTRY REBOUNDS
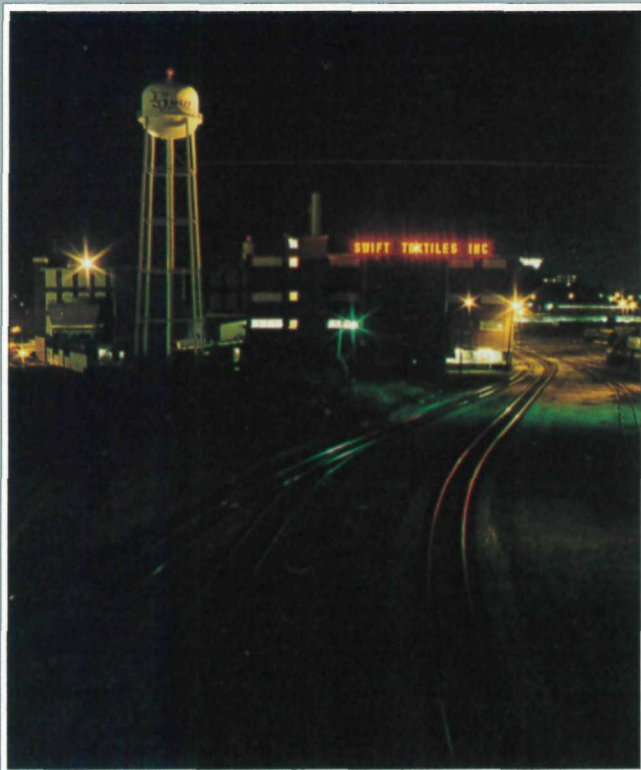
At Swift Textile's Columbus, Ga., plant, little beyond the docks reflects traditional mills. After unloading, raw cotton is automatically blended with synthetics (*right, above*). Yarn is spun into thread while a robot — and occasionally Swift president Robert Koon — patrols the spindles. The robot is programmed to replace full spools with empty ones (*far right*).

valves to release more chemicals. Just a few years ago, human operators controlled the equipment, relying on their experience to adjust the complex processes. But no human could match the computer's electronic vigilance and lightning-quick response.

Across town in a hundred-year-old brick building, a computer-controlled robot supervises a long line of spinning frames. Encountering a completed spool, it snips the stream of yarn, nudges the filled spool onto a conveyor belt, starts the next one spinning, then glides down the line in search of more completed spools.

Operating spinning frames like these once required a small army of workers, but this new equipment needs human attention only to load the filled spools onto carts for transport elsewhere in the plant. White-shirted engineers stop by periodically to check the machine's efficiency on its control computer.

Quality and productivity are the key words in Georgia's textile industry today. Companies such as Swift Textiles of Columbus — which has spent more than $111 million on capital improvements during the 1980s — have embraced process control computers, robotic spinning frames, automated guided vehicles, air-jet looms and other new technology in their quest to boost quality and improve productivity.

"In my opinion, the opportunities in textiles today are brighter than they have ever been before," says C. Robert

BEFORE AUTOMATION, EXPERTS THOUGHT U.S. TEXTILES COULD NOT COMPETE WITH CHEAP-LABOR IMPORTS

Koon, president and chief executive officer of Swift. "We are an industry in the early stages of blossoming with modern methods and great opportunity."

Similar sentiments flow from Roy Bowen, executive vice president of the Georgia Textile Manufacturers Association (GTMA).

"I see this industry growing as we become more robust and globally competitive," he adds. "As we get our cost structure down through automation and increased productivity, we are going to be adding capacity because

A computerized machine, checked by Doug Morgan *(top),* monitors vats of dye, ensuring proper color mixture, temperature and quantity. Another machine counts fabric whirling by, cutting precisely to manufacturers' orders. A million feet of floor space and millions of dollars worth of equipment require only a few human workers, among them Tech grad Scott Bryan *(at right, checking weaving production on the air-jet looms).*

there will be a growing demand for our products."

Barely five years ago, many observers declared the U.S. textile industry dead.

Battered by imports, many companies shut their doors. Stories of layoffs and plant closings dominated the news. The U.S. industry, experts said, simply could not compete with the low wages of China, Taiwan and other Pacific Rim nations. But like Mark Twain many years before, the U.S. textile industry can truly say that reports of its demise were greatly exaggerated.

Today, Georgia's textile industry is growing once more, adding 6,800 new jobs over the past two years alone. Though employment levels remain well below peak times in the early 1970s, the industry continues to be Georgia's largest manufacturing employer, with approximately 110,500 persons at work earning a payroll of more than $2 billion a year.

And for many textile companies in Georgia and the Southeast, 1987 was a year of record profits.

In today's textile industry, computers control virtually every step in produc- tion and delivery

What brought about this turnaround?

"The textile industry in America for the past several years has spent more than $2 billion dollars a year on modernization," explains Koon. "There are fewer compa- nies in the business, but they are larger companies. They are modern companies run by modern business people with modern business principles."

At Swift's two production facilities in Columbus, com- puters control and monitor virtually every step in the manufacturing process, from receipt of baled cotton to

loading finished denim onto trucks. Each cotton bale entering the plant gets a bar-coded label and a comprehensive quality inspection, beginning a process designed to build in quality and meet the exacting standards of jeans manufacturers like Wrangler, Levi Strauss and Lee.

Fiber blending machines mix cotton from many bales and blow it into overhead ducts. Other equipment extracts stray cotton stems or other trash which could diminish quality in the spinning process.

Automated material handling systems move cotton

Automated vehicles, guided by wires buried in the floor, haul two-ton rolls of fabric from one operation to the next. Finished rolls are stored in a warehouse, the computer remembering precisely where each roll is located.
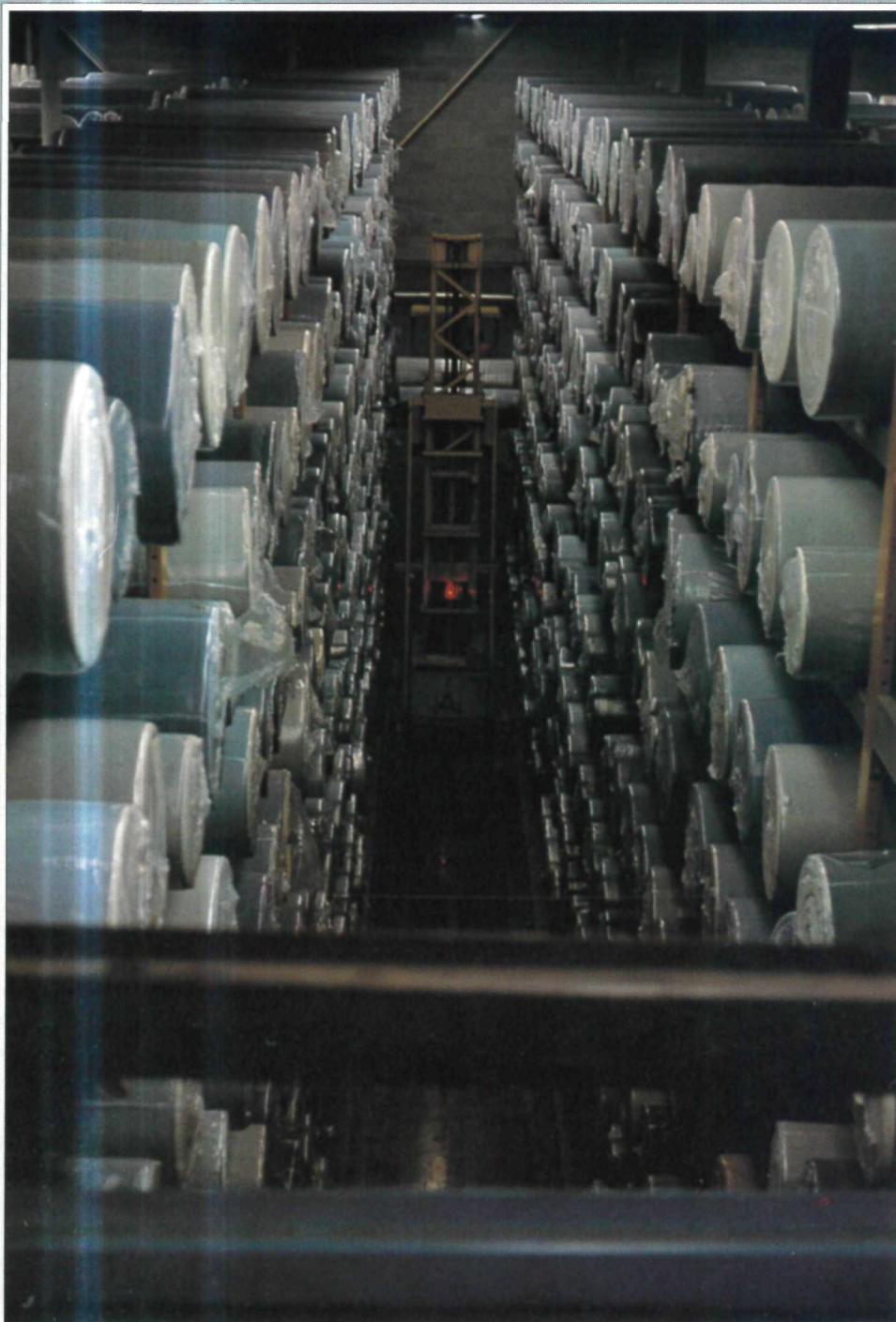
ropes to state-of-the-art spinning frames whose microprocessors monitor each inch of yarn for quality and create a record for later analysis by the company's computers. Computer shade matching, more accurate than the human eye, ensures that each batch of fabric is the same as the last. Quality control workers examine every yard of completed fabric for defects before loading it onto shipping trucks.

Swift's eight-year-old Boland plant is one of the world's largest producers of denim fabric. Looms in operation there were the best available just a few years ago, but Swift is replacing all of them with better equipment. New air jet looms now available operate twice as fast, allowing Swift to boost its capacity by 50 percent with just a modest increase in its work force.

Such equipment investment has helped the industry boost its productivity at a rate twice the U.S. average.

"You cannot do business in tomorrow's world with yesterday's technology," Koon asserts with an almost evangelistic flair. "We've got more computer power at Swift Textiles today than was in existence in Columbus ten years ago. If the computer goes down, we shut down. It's as simple as that."

Automation and computer control allow the U.S. textile industry to manufacture its products with fewer workers, reducing labor costs to compete with foreign producers. But, just as importantly, the new technology allows companies to make a better product.

"We want to make every yard just like the last one," explains George Pearce, EE '75, MS IMGT '76, who is responsible for new technology at the Boland plant. "If we produce a quality product consistently, our customers can make a better final product."

He adds: "We consider ourselves to be in the jeans business. If our customers are successful, we can be successful, too."

Manufacturing concepts such as "just-in-time" delivery — popularized by Japanese manufacturers — have found ready acceptance in Georgia's textile industry. A Levi Strauss jeans plant in Valdosta, for instance, maintains no inventory of denim fabric. Instead, it relies on trucks from Swift's Columbus plant to arrive each day with enough fabric for that day's production. Swift knows just what kind of fabric to send because its computers know what customers have ordered from Levi. And Levi knows it can count on Swift to send the right type of fabric — with a quality that meets its standards.

Roy Bowen argues that "just-in-time" delivery and "quick response" hold the key to the future for the U.S. textile and apparel industries.

"Quick response is a linkage between the textile producer, the apparel cutter and the retailer," he explains. "It is a partnership that cuts out as much as 85 percent of the lead time because everybody is linked by computer."

When retailers purchase garments from overseas manufacturers, they must anticipate fashion trends and sales volumes as much as two years ahead. If their projections are wrong, the garments may have to be sold at a loss.

By cutting that lead time, U.S. producers can reduce that risk for the retailer and gain for themselves an important competitive advantage.

"You can make an item closer to when the customer is going to buy it, and you can be more accurate in sizing, style, quantity and other decisions," Bowen notes. "It makes sense for domestic retailers to buy domestically."

Rapid communication via computer has facilitated the relationship among textile producer, apparel manufacturer and retail store.

"When you buy a coat off the rack, the apparel cutter knows about it and the textile manufacturer knows about it," Bowen says. "They can get something back on the rack to replace it in a very short time."

For the future, Bowen anticipates more automation, more technology and more applications for textile products. Composites used in the aerospace industry, geotextiles used in highway construction and even artificial blood vessels offer new markets.

At Georgia Tech, researchers are exploring new applications for textiles, as well as improving conventional processes. Their work on waterless slashing, dyeing, printing and finishing has gained international attention.

"We need to open up and develop new markets for engineered fibrous structures," declares Dr. Fred Cook,

A NEW ROLE FOR TECH

OPPORTUNITIES GROW AS COMPUTERS, AUTOMATION EXPAND TEXTILE INDUSTRY'S POTENITAL

Resurgence of Georgia's important textile, carpet and apparel industries has generated a strong demand for textile engineers, chemists and managers — a demand Georgia Tech cannot now meet.

"The textile industry's conversion from labor-intensive to capital-intensive processes over the past decade has created a tremendous demand for technically-oriented graduates to design, implement, operate and manage these new technologies," explains Dr. Fred Cook, the school's director.

At the same time, the growing use of engineered fibrous structures for applications such as aircraft composites has offered new opportunities for persons trained in fiber technologies.

To help meet those demands, the School of Textile Engineering has increased the number of student scholarships available, implemented a new multi-disciplinary certificate program and made plans to dramatically boost student enrollment. It has also developed research programs designed to help the textile and allied industries remain competitive in world markets.

The school's changes are part of a five-year plan developed by a committee of industry representatives, Georgia Tech administrators and faculty. An advisory board with similar representation is being formed to help guide the school's future.

The textile industry itself provides $125,000 a year for scholarships, allowing Cook to offer monetary support irrespective of financial need to more than half his current students.

The textile, carpet and apparel industries have also given generously toward the school's capital needs, providing more than $1 million in new equipment and funding a $430,000 renovation of laboratory space needed for teaching and research.

In addition, Georgia's carpet industry recently raised $1 million to endow carpet research programs at Georgia Tech.

Georgia Tech operates the only textile engineering degree program in the United States accredited by ABET, the Accreditation Board for Engineering and Technology.

Despite the overwhelming demand for textile graduates, Cook has found that the industry's image problem — left over from the much-publicized layoffs of workers in the 1970s and early 1980s — often makes high school students hesitant to consider a career in the field.

To counter that image, the school has joined with the Georgia Textile Manufacturers Association in efforts to educate high school students, teachers and counselors about career opportunities. GTMA sponsors a full-time enrollment coordinator, who visits schools to talk with students and staff about the modern industry and career opportunities.

Until recently, enrollment in the School of Textile Engineering was declining, hitting bottom in 1987 — just as opportunities for its graduates began to reach record levels.

Today, textile engineering graduates from Georgia Tech receive a minimum of three job offers each, with average starting salaries now approaching $30,000.

To meet its founding commitment to Georgia industry, and to produce the trained graduates needed to keep it strong, Tech plans to increase its textile enrollment by 50 percent over the next five years.

Those efforts have already begun to pay off. The school's freshman class grew by 30 percent in the fall of 1988.

In addition to four-year-degree students who traditionally enter the manufacturing industries, Tech plans simultaneously to attract more individuals to its graduate program. Students with advanced degrees often find employment conducting research and development for suppliers of chemicals, fibers and equipment to the base manufacturing industries.

A new multi-disciplinary certificate program will allow Georgia Tech students with majors in other areas of science, engineering and management to gain a functional knowledge of textiles. ■

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director of Tech's School of Textile Engineering. "We don't care whether the fiber is in structural form, whether in an apparel item, a carpet, a missile nose cone, or a stadium field. We are going to be involved, and we are going to support our traditional industries and product outlets."

The new Apparel Manufacturing Technology Center, formed as a partnership between Georgia Tech and the Southern College of Technology, serves as a demonstration project for transferring cutting-edge technologies to the industry and developing new research projects to advance automation in the apparel industry.

What will all this mean for the textile employee of the future? "We'll have more mind-oriented jobs," answers Koon. "We've got to have people who can communicate better. We need people who have analytical skills, who are willing to ask questions, who have active minds, good imaginations and are creative."

The industry needs people with more technical training, people who can not only understand today's technology, but who can also adapt to tomorrow's. To find those people, Koon looks toward universities like Georgia Tech and to adult education programs offered in Columbus.

Eighty-five percent of the workers in the year 2000 are already in the work force, he notes. Improving Georgia's educational system will help new workers, but what about those already in the work force?

Koon believes a good employer should help workers improve their skills. Some 450 of Swift's 1,100 employees are enrolled in adult education programs, which teach skills starting with basic literacy. "Business has got to address adult education strongly," he insists. "We have got to have better employees to run this equipment, but it is not fair to bypass some of the most dedicated and loyal employees we have just because they don't have the educational skills."

He hopes that by making education important to his workers, he can make education important to his workers' children — and encourage them to obtain the skills needed to compete in tomorrow's work place.

The industry also looks toward colleges like Georgia Tech, but finds the industry's poor image — fostered in

> **TEXTILE ENGINEERING GRADUATES OF GEORGIA TECH RECEIVE THREE JOB OFFERS EACH, WITH STARTING SALARIES APPROACHING $30,000**

the news media to highlight problems with imports — keeps many high school students from considering a career in textiles.

"In our efforts to get the trade bill passed, we had focused media attention on the impact of imports," recalls Bowen. "We definitely have an image problem, and that is something we are trying to overcome."

Ironically, opportunities for college graduates have never been greater *(see story, page 31)*. Yet until recently, enrollment in the School of Textile Engineering was declining, bottoming in 1987.

"We are in a severe supply and demand situation with students and employers," Cook reports. "As the industry has become more capital-intensive, it has created a tremendous demand for graduates to design, implement, operate and manage the new technologies."

To help supply the needed personnel, the Textile Education Foundation, managed by the GTMA, offers 50 scholarships a year at Georgia Tech and the Southern College of Technology in Marietta. The organization also provided the School of Textile Engineering funds for new equipment, technician salary supplements, faculty travel expenses — and a full-time enrollment coordinator who travels the state educating high school students and inviting them to consider textile careers.

Just as the fortunes of the textile industry have turned around, so have the fortunes of the School of Textile Engineering. Enrollment of freshman students for 1989 is up 30 percent over the previous year.

"We've got to work with Georgia Tech to provide graduates who are going to be the future leaders of this industry, and we need to rely on Georgia Tech as a research institution to develop the new products and technologies we will need to compete in the global economy," adds Bowen.

"A lot of people think of the movie Norma Rae when they think of the textile industry," he concludes. "Nothing could be farther from an accurate image of today's industry. We're going to continue to work to make sure that image is well behind us." ■

John Toon is assistant director of Georgia Tech's Research Communications office.

Darryl Greene knows that teamwork is the key to winning.

Just a year out of school, Darryl Greene is responsible for supplies and services that support 14 major plants in GE's Lighting business.

What makes this young engineer so successful, so fast? His dynamic sense of teamwork is a big factor. He's got the confidence to interact with people at all levels. His personality inspires trust. He knows how to act like a leader, so his colleagues will act like a team.

Darryl knows it takes the best resources to back a winner. That's why he chose a job with GE.

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The mark of a leader.

A **bullet hole rips through the** red cover of Carl Biven's book, and a gun barrel juts dramatically beside the provocative title—*Who Killed John Maynard Keynes?*

Dr. Biven, an economics professor at Georgia Tech, is somewhat amused at the cover created by his publisher, Dow Jones-Irwin. Biven is not a writer of detective novels, and his book is not a mystery—at least not in the traditional sense.

But the book may snare a few unsuspecting mystery buffs if they don't read the subtitle: *Conflicts in the Evolution of Economic Policy.*

Several years ago, Biven read a comment by University of Chicago economist Robert Lucas that "Keynes is dead." The question that popped into Biven's mind was, "Really? Who killed him?" And that, he says, sounded like a title for a book.

Lucas was not talking about Keynes' physical death. The famous British economist died in 1946 and is buried in Westminster Abbey. Ten years before his death, Keynes wrote *The*

Who "Killed" Keynes

A Georgia Tech professor's new book asks: Are the theories of John Maynard Keynes dead . . . or just hiding in more modern disguise?

Written by John Dunn
Photographed by Margaret Barrett

General Theory of Employment, Interest and Money, which Biven calls "the most influential book in economics written this century" and which launched the "Keynesian

Revolution" in economic thought and application.

The Lucas statement reflects the dissent among economists for the past four decades about how the national economy works and the appropriate strategy for economic policy. Biven notes that it is possible for two Nobel Prize winners in economics to give a president diametrically opposed advice on how to deal with a specific problem — in fact, it has happened.

"It seems to me," says Biven, "that the public would naturally ask the question, 'Who are these people and where are they coming from?'"
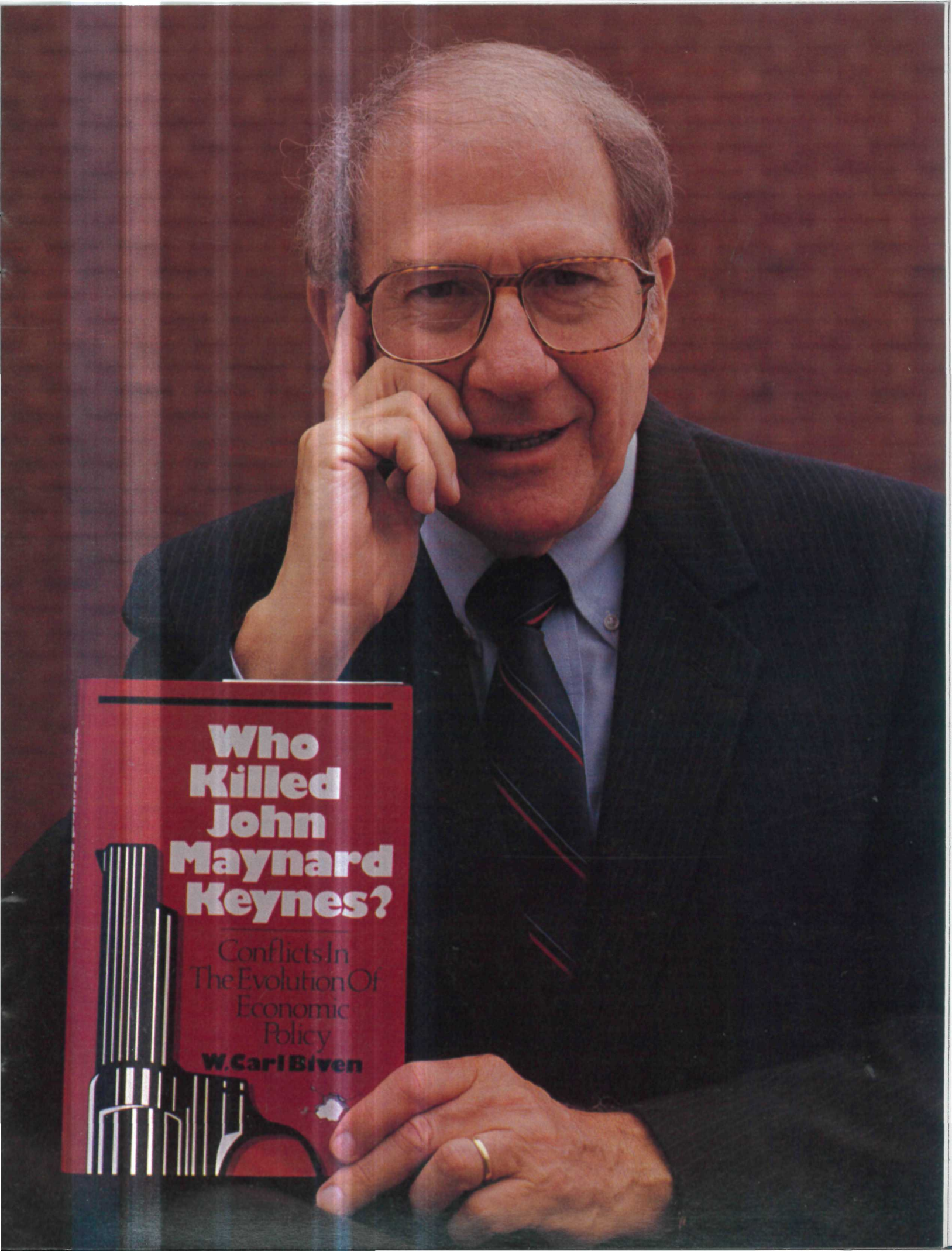
The book traces controversies in the evolution of economic policy over the postwar period, using Keynesian economics in a point-counterpoint motif.

Even for those who reject all or

Tech's Carl Biven: *Exploring the "death" of Keynes' theories.*

Keynes' ghost, even after a half century, presides over today's economic debate

part of his theories, Keynes still provides a point of reference for explorations in other directions. His 1936 treatise is still the focus of controversy among scholars. There is hardly an annual meeting of the American Economic Association at which a session on some aspect of his ideas does not find its way onto the program.

"His ghost," says Biven, "even after half a century, presides at the debate of economic issues."

Keynesian economics reached the height of its influence during the Kennedy administration. It was during this period that the American public learned about the use of the federal budget, in the form of a tax cut, to stimulate the economy.

"The crisis of confidence in Keynesian economics came with the inflation of the late sixties caused by the increased outlays of President Lyndon Johnson's Great Society program combined with the surge in military spending for the war in Vietnam," Biven explains.

"As inflation continued into the '70s, Monetarism, a revisionist school of thought led by Milton Friedman of the University of Chicago, rose to challenge Keynesian orthodoxy. It had a strong impact in the academic community and influenced Wall Street in terms of policy indicators used to monitor Federal Reserve behavior," he adds.

In his book, Biven describes the effect of Monetarism on Federal Reserve strategy under chairman Paul Volcker. The influence of Monetarism waned in the 1980s as measures of the quantity of money began to behave in an erratic fashion.

The school of thought associated with the Reagan administration is supply-side economics. Biven takes a long look at the effects of the budget deficits resulting from the large tax cut of 1981.

"This is my favorite chapter," Biven says. "We will be dealing with the federal deficit for some time into the future.

"The most important implication of the deficit is in terms of our international trade relationships," continues Biven, whose book also examines the exchange rate system and how the budget deficit led to the trade deficit. Keynes reappears in this discussion because he played a central role in devising the system that replaced the gold standard after World War II.

Biven takes pains to make this economic tale palatable and interesting. There are human-interest profiles and character sketches of the most influential economists of the postwar period.

One of the most colorful is Joseph Schumpeter, who spent most of his career at Harvard. Like Keynes, he was born in 1883, the same year Karl Marx died. Schumpeter, one of the dynamic figures among American economists, was not sympathetic to Keynesian philolsophy.

Keynes' main concern was with the short-run fluctuations of the business cycle, particularly the collapse of the Great Depression. Schumpeter was more interested in the long-term growth of the economy. At the center of the growth process in Schumpeter's model is the entrepreneur, the innovator who takes an invention or a process and exploits it commercially. Economic growth takes the

form of repeated surges in economic activity stimulated by the ideas of creative managers, according to Schumpeter.

The most fascinating profile in the book is that of Keynes himself. Keynes was not only a Cambridge professor who wrote the classic work in macroeconomics, but was also involved in practical affairs to a degree uncommon for economists. He participated in decisions at the highest levels of the British government during the two world wars. He also made a fortune speculating in financial markets and the foreign exchange.

"Keynes was listened to by the business community," Biven says. "He was one of the few economists who could move the market. He came out with his pronouncements and the stock market would go up or down."

Biven's book flows from three decades of attempting to make economics understandable and interesting to Georgia Tech students. Biven estimates that he has taught at least 15,000 students who are now Tech alumni.

And what if a mystery reader stumbles upon the book?

He may be in for a very pleasant surprise. Biven develops his story and unveils his plot with the skill even a fan of Sherlock Holmes can appreciate. ∎

Who Killed John Maynard Keynes? (Dow Jones-Irwin, Homewood, Ill., $19.95) is available at the Georgia Tech bookstore and other bookstores. A paperback edition is being prepared as supplementary reading for college courses in economics and in social science survey courses.
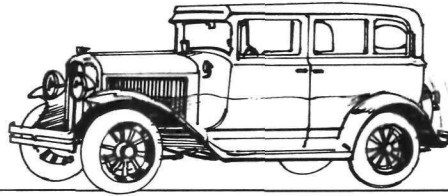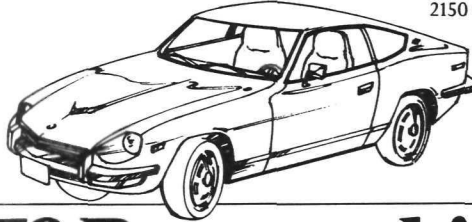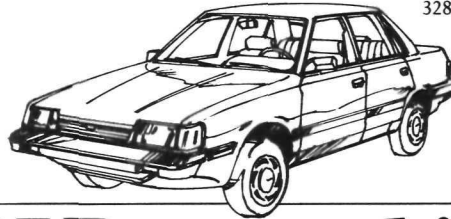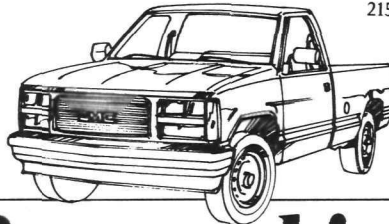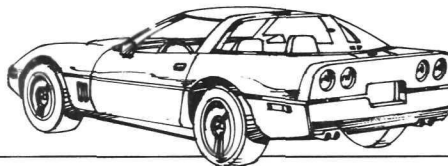
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Secrets of a High Achiever

Interview by B. Eugene Griessman
Photographed by Margaret Barrett

Paul F. Oreffice, chairman of the Dow Chemical Co., recently spoke with students and faculty of the College of Management.

Oreffice hardly fits the mold of Fortune 500 CEOs. An immigrant trained as an engineer, Oreffice has not worked in law, marketing, accounting or sales; but he pioneered Dow Chemical's international operations on his way to becoming chief executive officer.

Oreffice, who speaks five lanugages, joined Dow Chemical in 1953. Three years later, when he was 28 years old, he was asked to set up a marketing program for Dow Chemical in Brazil.

In 1978, following success in the overseas operations he directed, he became president and CEO of The Dow Chemical Co. He became chairman in May 1986.

In this interview, Oreffice discusses his career and his views on management and achievement.
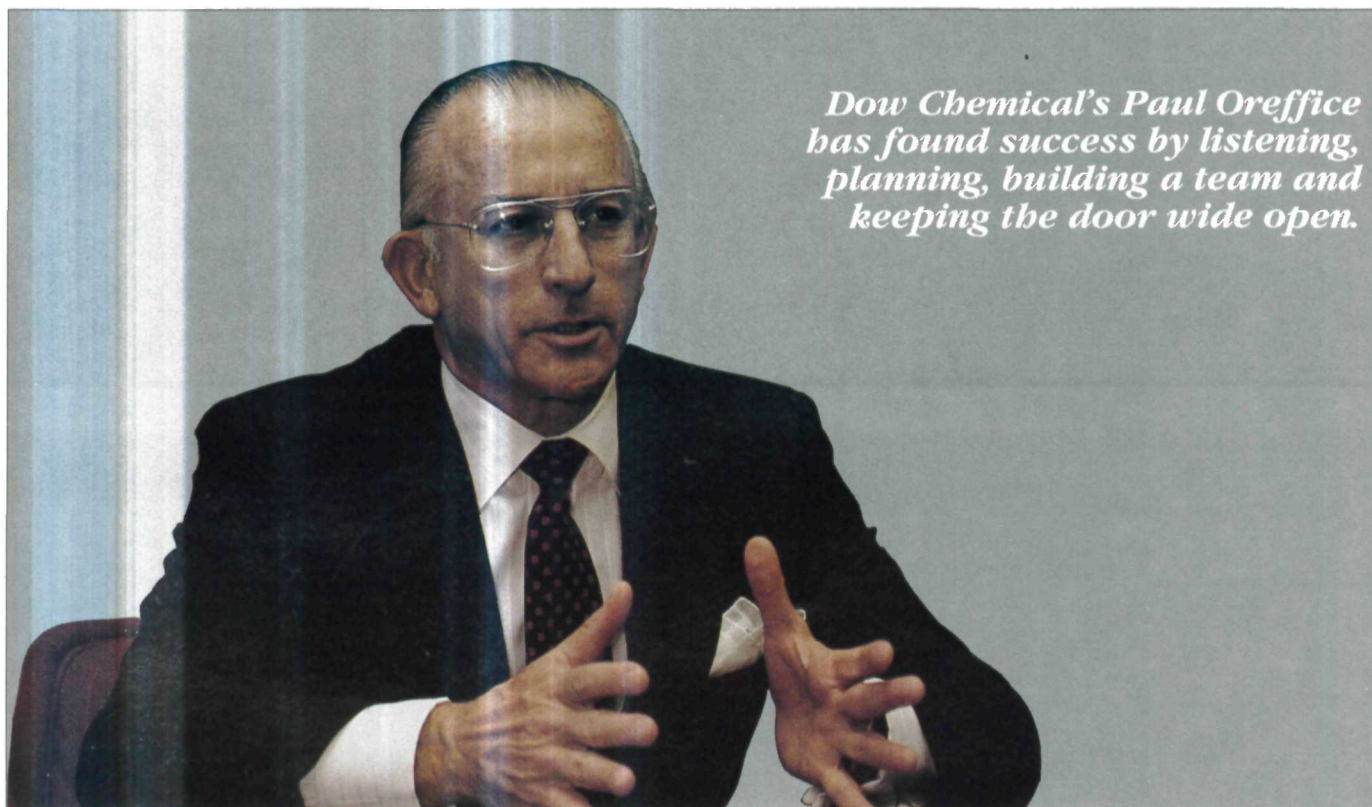
Dow Chemical's Paul Oreffice has found success by listening, planning, building a team and keeping the door wide open.

Suddenly, I was running Latin America. I wasn't a stepchild, I was sitting at the same table as the president of Dow U.S.

Your success with Dow Chemical really began in Brazil. Were you prepared to begin operations there?

I didn't really know what I was doing—this was the first place outside the United States where Dow had marketed directly to the customer. It was sort of a pioneering thing. When Brazil started working well, we started doing the same thing in a few other places.

When I joined the company, only 6 percent of our business was outside the U.S., and 4 percent of that was in Canada, so we were really a national company.

By 1959, Dow had decided that it made sense to make the whole world its market, so they took an up-and-comer in the company and put him in charge of international. The first thing he did was to call me back to Midland [Michigan]. I spent one day from noon 'til midnight with him, and all he did for 12 hours was pump me. He said, "I know nothing about the international business; I know the chemical business. I know we have to get big abroad; you've been abroad, I want to learn from you."

This obviously was very motivational for a 31-year-old.

How did you go about marketing Dow internationally?

First, we started creating a market for our product, then we built plants. Brazil is a classic example. When I went down there, all I did

was sell Dow products from the U.S. At one point we had a chartered ship going down every 20 to 30 days. Then we started building plants for products, some of the plastics, pharmaceuticals, agricultural chemicals.

This is very different from the strategy used by many people who build a plant, then sell the product. We went backwards and it worked.

The key moment of turning into an international company came in 1965 when the decision was made to divide management into geographic areas. I was in Spain, where I had gone from Brazil. I was called to Midland and asked to create a Latin American area.

At the same time, somebody else was asked to create the Pacific area. We set as our management target five geographic areas, all reporting to the president of the company, each as a separate profit center, each with the same rights.

Suddenly, I was running Latin America. I wasn't a stepchild of the U.S., I was at the same table as the president of Dow U.S. Big change.

Ben Branch, who was running the program and later became CEO of the company, made a speech that none of us ever forgot. He said, "We can get all kinds of people who understand products, all kinds of people who understand technology, but we don't understand the country unless we live there. So we must become local wherever we operate."

Now Dow has an Englishman as the manager in England, a Frenchman in France, an Italian in Italy, a Spaniard in Spain; it is a great part of our success.

You've been a top manager for many years. Assess your strengths as a CEO.

I'm very good at creating a team, at making other people work, and I think that in the final analysis, that's the top thing for a manager. If you can make everybody else work at 100 percent of capacity, you've done the job.

There are many ways to do this; one is com-

Continued page 45

Dr. B. Eugene Griessman, author of this article, is director of communications and development for the College of Management. He is author of the critically acclaimed book, *The Achievement Factors*, published by Dodd, Mead & Co., which examines motivational factors that brought success to approximately 70 notable people.

During a decade of interviewing successful and famous people, Dr. Griessman has found certain themes consistently emerged, although the people he interviewed had vastly different backgrounds, interests and occupations. A number of Georgia Tech alumni are featured in the book.

Q. When does a little really mean a lot?

A. When it's a contribution to Charitable Life!

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> ## *I told myself, "One brain can never be as good as two or as ten. So I've got to form a team and work with the whole team."*

munications. You have to communicate with your people if you expect them to understand where you're going. I like to set some targets and then work toward them. One knock on American business is that we are short-term oriented. In 1978 I held a meeting to talk about the year 2000. All I wanted to talk about was how we were going to be a great company 22 years from then. Seven years later I held another meeting to review what we had done and what we needed to do to be a great company in the year 2000. I think you have to set targets like that. People have to understand where they're going.

Second, you have to be a good listener. Sometimes it's harder for bosses to be good listeners than good talkers.

Another thing: never make decisions for your people. The surest way for a manager to make me mad is to say, "I have a problem. What should I do about it?" I want people to say, "Hey! Here's a problem. Here's what I intend doing about it."

How do subordinates communicate with you?

They talk fast, fast, very fast. Whom do I see more often? Someone who takes a half-hour to state a problem, or someone who within five minutes can tell me the problem *and* the solution? It's obvious. The same principle applies in paperwork. I was getting so much paper, I couldn't read it. In 1976 I issued an edict that, with only a few exceptions, I would not read anything over two pages long. So I get a report from a unit like Dow U.S., which is a $7 billion dollar company—one page. I get highlights of everything from sales to research. If I need more, I talk to somebody.

How did you learn what you are good at?

Evolution, through the years.

When did you realize that you were good at building teams?

It took time.

Maybe I can give you just a little background. I was a very shy, very timid person. And as I went about my business, this innate shyness was hurting me, so I said, "That is a drawback of mine I had better work on." Part of that was, I said, "Probably because of my shyness sometimes, I have a tendency not to trust others." So I said, "If I'm going to succeed, I have to trust others." I'm a Latin. Latins in general don't trust others very much. They tend to be a little more dictatorial in their managerial style. I told myself, "One brain can never be as good as two or as 10. So I've got to form a team and work with the whole team."

It evolved.

When did I find out I was really good at it? Probably when I was in Spain, where I had the whole reconstruction of a company that was absolutely going broke. I had to make some very unpopular decisions. At the time I went over there I was 36 years old. I left when I was 40, having completely restructured the company and put it back on its feet. Today it is one of the most successful companies we have around the world.

That's where I said, "I'm pretty good at this."

And that kind of performance is noticed, no question about it.

Now the advice I give our young people is, "Do the common thing uncommonly well." Do every task well. Some tasks appear menial, you know. It would be easy to complain: "I'm a chemical engineer and I have to worry about this paper work?"

It's absolute bull that you have to be a "yes" man to get ahead. The people who attract attention are the ones who have ideas and bring them out.

When I was in Brazil, I was a very young man, and not a financial person—I'm a chemical engineer. Financing was the toughest thing.

Continued next page
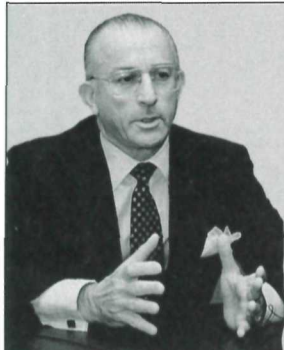
Don't put off solving problems. Decide today. Use your best people to help you solve a problem. And don't be afraid to ask for advice.

I invented a new way of financing. I went trembling to the finance committee of Dow to ask to set up the new program. These people said, "Hold on a second. Why should we do this with Brazil? It's a dangerous country, isn't it?" And Carl Gerstacker said, "Look. I think we owe it to Paul. He's got a good idea. I don't quite understand it, but I think we owe it to him to give him his money." They had that kind of faith.

Incidentally, one of the things I keep pounding into our people is that we don't move people early enough. As we've gotten bigger, the tendency is to let people come up through the ranks. Maybe we have to gamble sometimes with some young people. It certainly has worked well for Dow before.

I'm an example. I invented a new way of financing and sold it to the company. That brought attention from our top management. "This guy might have some unusual talent." They started keeping their eye on me.

They made it a point to occasionally come and travel with me in Latin America, for instance. And as you get close with people, play cards together, play golf occasionally together, yes, you wind up getting a lot friendlier, trust builds, you have opportunities to impress. But I always felt they had to initiate it.

Most of us make some bad decisions. How do you recover when you've made a dumb move?

The first time I made what seemed a fairly major boo-boo, the boss said, "You know, I've made more mistakes than anybody in this company." That makes you feel pretty good. The boss is standing behind you. I learned from that.

If you make the same mistake two or three times, somebody ought to kick you in the behind. But there is nothing wrong with

making mistakes. It means you are doing something.

Any guidelines you follow for problem solving?

Number one, don't wait until tomorrow, solve them today. The worst thing you can do is to say, "Let's wait until next week." Decide today.

The other thing is to use your best people to help you solve a problem. And don't be afraid to ask for advice.

We were offered an opportunity to buy a major company a few years ago. I gathered four of the top people and I said, "Okay, let's put down the pluses and the minuses of doing this." We concluded that the minuses were too strong and turned it down. In that situation writing down the pluses and minuses helped.

Do you have any tips for managing time?

Short communications is one. Then setting priorities. That includes setting time for my kids and for civic activities. And for myself. Even today, I play tennis three or four times a week. That's on my calendar; I just slide it in. Sometimes it's not easy, but it is part of a whole life.

That doesn't mean I need a formal list; I just know the things I want to do. When my kids were growing up, I wanted to spend time with them; I knew that someday they'd leave. They live in different parts of the country now. We were so close then that we are still very close. Our vacations are still spent together. I always considered it an absolute priority. Managing my son's little league team was a priority, and I found a way to do it.

Let's talk about your personal management style. Do you avoid confrontations?

Absolutely. Confrontations in general just lead to both parties being worse off.

In most cases it is just that I heard something and he heard something and it if you just sit

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down together you find you work things out.

Is a display of temper ever useful?

Yes, I have occasional controlled displays of temper, to make a point. For instance, when a meeting starts going far afield, somebody's got to bring it back, and once in a while I'll bang my hands down and say, "Damn it! Let's discuss what we are really going to do."

I'm not angry, but nobody else knows that.

Do you have a specific style in chairing a meeting?

I listen a lot—unless it's getting longer and longer. I have been prone to say, "Hey folks. We are taking too much time." Meetings are second only to paperwork as one of the big problems of American business.

What about office dress? What's expected?

Most top managers are too formal. I often wear a sports jacket to the office to make other people feel comfortable that they can do it. Everybody follows the boss. We have an air of informality within the company, an open-door policy. There are very, very few hierarchical things. If I want to talk to somebody three steps down, I don't have to go through his bosses.

Part of that informality is strictly the example you set from the top. That is as true in clothes as in meetings and in attitudes.

I set a target for myself when I first became president of our U.S. company that I would meet with a minimum of 5,000 of our people every year. I have never missed a year.

In 12 years I've always been able to meet between 5,000 and 10,000, in groups that range from 20-some to a couple of hundred, in our plants, sales offices, all over the place. Most of the sessions are a short talk and just give-and-take.

Do you work to remember the people you meet in these sessions?

I have a good memory. However, when I'm impressed with someone, favorably or unfavorably, I keep a record, just to check if that impression is correct.

For instance, when I first see trainees, I keep track of the ones that are most impressive and least impressive and check five years later to see if my first impression was right. It's not that I do anything with it, I just check.

How often have you been right?

Oh, I've been right more than I've been wrong, but it is not by a huge percentage.

The other thing I do, by the way, is once a year to meet with my top staff, and for four days, we review more than a thousand individuals as individuals, as different human beings, not as a number—what their job is, which ones have high potential, which ones have reached their plateau.

What impresses you favorably in a group of young trainees?

I have a sheet showing me what their backgrounds are, their academic records and so forth, but the thing that impresses me the most is the kind of questions they ask, the poise they have—the quality of the questions and of the conversations. I ask them questions, too.

Would it be a mistake for a person to say, "I'm not going to talk at all in a meeting. I'm just going to do good work and let my work speak for itself"?

You can't find out who they are if they don't speak up.

As time goes by, you do find out from the work they do what sort they are and what their potential is, but if they are always silent in the meeting when you see them, it's much tougher for them to be appreciated by the managers. No question about it. ■

Workplace Researcher

Written by Charles Hyatt

Drugs in the workplace, AIDS, the behavioral problems of employees, and a company's policy regarding such business nightmares, makes for a routine day for Dr. Terry C. Blum.

An expert on organizational behavior and employee assistance programs, Blum is conducting pioneering research into some of the thorniest problems facing today's business world.

Blum is principal investigator for two federally funded research' projects administered exclusively through Georgia Tech. The first analyzes two human resource management strategies: employee assistance and drug screening. Through questionnaires and interviews, data is correlated on the workplace impact of drugs and alcohol, AIDS, safety, stress and other family or personal problems. Blum is examining the interplay between policy, public resource allocation and the implementation of public policy in the private sector in relation to these issues.

According to Blum's findings, the number of employees who enter drug treatment programs is, on average, no different whether or not the company offers pre-employment drug screening programs. That means, basically, that pre-employment drug screening does not protect companies from hiring someone who has a drug problem or who may develop one.

"We're seeing a lot of media hype about 'the war on drugs,' and while we certainly don't want to underestimate the problem, we don't have to exaggerate it either," says Blum. "In fact, it would be almost impossible ever to attain a totally drug-free society and remain a democracy which still respects individual liberties. However, we do have strategies to deal constructively with the problem at the worksite."

Blum's other Georgia Tech project is a study of new methods of providing employee assistance consultation and services. She works closely with Georgia Tech's executive-in-residence, William Perryman, who was director of employee-assistance programs for the Aluminum Company of America.

The Institute of Medicine of the National Academy of Sciences has commissioned Blum to study the evolution of workplace drug-abuse policy, the public/private interface, the availability of insurance coverage, and access to treatment. Another National Academy of Science panel has asked to see results of her research human resources management strategies and the impact of employer policies on the American family.

For Southern Bell, Blum has performed a study concerning the integration of their employee assistance program into the company's personnel/human resources functions.

"Sociologists don't always get the same kind of respect that the 'hard scientists' do," Blum says. "People often think that sociologists are socialists or social workers or somehow connected to the labor unions.

"But as a professor of management, I have an applied mission, and there's a more immediate level of acceptance in the professional community, particularly when we go to area businesses. Tech already has a great reputation and that's carrying over to its college of management."

At Tech Blum heads a staff of 15:

The Blum File

- **1982:** Receives Ph.D. in sociology from Columbia University, specializing in organizational theory, research methodology and psychiatric epidemiology.
- **1983:** Assistant professor of sociology and adjunct professor of biostatistics and epidemiology, Tulane University.
- **1983-86:** Co-director, Work Organizations Research Project, Tulane Alcohol Research Center.
- **1986:** Joins Georgia Tech faculty; granted tenure, 1988.
- **1989:** Advisory board member, National Institute on Drug Abuse (NIDA)-funded study of Georgia Power's drug-screening program.
  — Member, study group of the Prevention and Epidemiology Initial Review Group for NIAAA.
  — Review consultant, NIDA Office of Worksite Initiatives.
  — Member, review groups of the Small Business Innovative Research grants program.

Tech's Blum: *Discovering solutions to today's marketplace problems.*

projects administered through UGA's IBR and Georgia Tech.

The first is a four-year study of chemical dependency treatment organizations and the workplace. The research focuses on establishing a balance between health care cost containment and quality health care. With major funding from the National Institute on Alcohol Abuse and Alcoholism (NIAAA), Blum and Roman are examining the inter-organizational frameworks among business, insurance companies and treatment centers. Struggling with such major questions as "Is alcoholism a disease?" and "Are we medicalizing dependencies?" their findings may have significant implications for industry and insurance companies.

On their other joint grant, the co-investigators are training post-doctoral research fellows to study workplace problems, including employee turnover, alcoholism, drug and emotional problems and other maladaptive behaviors.

"Behavioral health problems can be seen as either cause or effect, and sometimes both," says Blum. "They can manifest themselves in poor productivity and performance, or they can be caused by poor and stressful working conditions.

"When an employee tries to cope through escape, the coping can take over, take on a life of its own, and become an end in itself," concludes Blum. "We're training these post-docs, two sociologists and two industrial/organizational psychologists, to recognize and deal with a number of these conditions." ■

nine graduate and undergraduate students, two full-time employees and four post-doctoral students. Through her efforts, Georgia Tech has contracted to do almost $2 million in research over the next four years, as well as another $2 million in jointly administered projects with the University of Georgia.

Before coming to Georgia Tech, Blum was on the staff of Tulane University, where she met Dr. Paul Roman, a sociologist. Now her husband and colleague, he works for the University of Georgia's Institute of Behavioral Research (IBR) in Athens.

Together, the husband and wife team are co-investigators on two

Charles Hyatt is a doctoral student in psychology at Georgia Tech.

Is DOS Facing Extinction?

Written by Dan Darby

Most people who work with personal computers are aware of the controversy OS/2 is causing in the high tech arena. Championed by industry giants IBM and Microsoft, OS/2 is considered by many to be the operating system of the future and will soon move the standard DOS operating system to the back shelf. The debate of "OS/2 or not OS/2" has created heated exchanges in corporate meetings and industry magazine editorial pages.

Many industry analysts believe that DOS, now eight years and nine versions since its introduction, has run its full course and will soon be muscled out of the market by OS/2 just as DOS supplanted the old standard operating system, CP/M.

Admittedly, the technical innovation of OS/2 is appealing. Among its functions is a multi-tasking feature that will enable users to manage multiple processes within a single application. For example, spreadsheet users could perform calculations in one worksheet while creating and sorting data in another.

Another OS/2 breakthrough is its ability to address 16 megabytes of memory, far exceeding the 640K DOS limit. Software companies that develop packages for the OS/2 range of memory will be able to offer users larger spreadsheets, bigger databases, more enhanced word processors and desktop publishers. Proponents of OS/2 also speak highly of its Presentation Manager, a graphics interface that offers, in addition to the standard A: or C: prompts, pull-down menus similar to Apple's Macintosh operating system.

Although these innovations are impressive, it still seems highly unlikely that OS/2 will be able to completely move DOS out of the marketplace. What seems more likely to occur is that OS/2 usage will dominate the personal computer market with DOS running behind with a market share of its own.

The rationale behind this viewpoint includes the hardware changes and costs involved in making the move to OS/2. While OS/2 proponents point out the program's ability to surpass the 640K limit, few mention the large amount of internal memory required to run it. OS/2 needs at least one-and-one-half megabytes of random access memory to operate. And, should a user want to run OS/2 alongside DOS, the RAM requirement exceeds 2 megabytes. To use the multi-tasking feature, the system requires one-half megabyte to run each application simultaneously.

Conversely, DOS 3.3 memory requires 79K of RAM and DOS 4.0 needs only slightly more. Currently, most systems run on 512K RAM and few software packages require 640K. For systems that only meet the DOS 79K requirement to convert to OS/2, RAM upgrades offer a solution. However, the costs of memory boards and chips are relatively high, especially when multiplied by the number of PCs in use in an organization.

OS/2 convertees should also be aware that OS/2 runs only on the IBM PS/2, IBM PC AT, IBM XT Model 286 and other PCs that are 100 percent compatible with these. In addition, standard PS/2 machines are not automatically ready to use OS/2. IBM PS/2 models 25 and 30 do not come with the necessary 286 chip. Models 50 and 60 have 286 chips, and model 80 has a 386 chip, but they lack the required amount of memory.

Another important hurdle when considering OS/2 is the lack of applications. In a scenario reminiscent of the old "chicken-or-the-egg" question, many software developers are waiting for new hardware and user demand. Hardware vendors are looking to software developers to make the first introductions, and users are holding back their enthusiasm until they actually have applications to use.

The decision to move to OS/2 or stay with DOS may ultimately depend on money. True, OS/2 will offer enhancements and features not currently available in DOS. And while not every word processor or data entry user will need to perform multitasks or ever require more from their operating systems than the ability to copy, delete and change directories, the capability to do so may be very enticing. Users must determine whether the new technology that OS/2 delivers is a justification for the cost of upgrades of their operating system, software and hardware enhancements, or even new personal computers to operate them. ■

> ## OS/2 recalls the old chicken-egg scenario: which comes first, software or hardware?

Dan Darby is a free-lance writer in Atlanta.

Enjoy!

Ramblin' round the world . . .

The 1989 Alumni Tour Schedule

Journey of the Czars
June, 14 days

**Puerto Rico/
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June 15-18

Scandinavian Capitals
July, 13 days

Canadian Rockies Adventure
August, 10 days

Mediterranean/Greek Isles
Royal Viking Sky
September, 12 days

For information, contact:
Janice G. Sangster
Georgia Tech Alumni Association
Alumni/Faculty House
Atlanta, Georgia 30332-0175
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