The GTRI Connector

Question of the Month

When was the last time you wrote a hand-written note thanking a colleague, a subordinate or a boss for a specific job well done?

We all thrive on people noticing when we do something especially well. Yet not enough people invest that extra couple of minutes to communicate that they notice, care and appreciate.

Make it a goal to let people know that they're appreciated. Get in the habit of complimenting at least one person a week.

—Communication Briefings, July 1990

Architecture and GTRI cooperate on construction research studies

By Martha Ann Stegar, RCO

Item: The United States faces a monumental problem with the cancer-causing material asbestos—not only with its safe removal from buildings, but also with its safe disposal once removed. The hazardous waste must be taken to special EPA-approved landfills, which are gradually disappearing with public concern over landfill siting. As dump sites become ever more limited and remotely located, asbestos disposal will become ever more difficult and costly.

But a technology developed 20 years ago to simulate reentry temperatures on heat shields for the space program holds promise as a potential solution. Under a contract with the Army Corps of Engineers' Construction Engineering Research Laboratory (CERL), GTRI research engineer Guillermo Villalobos is evaluating the use of plasma arc technology to destroy asbestos waste-containing materials. The study is part of a joint effort by Georgia Tech's Construction Research Center and two private companies: Asbestos Abatement Technology, Inc., and Plasma Energy Corporation.

"This technology could provide the only proven pollution-free solution to the long-term disposal problem of asbestos," says Dr. Louis J. Circeo, director of the Construction Research Center (CRC). A plasma torch can routinely achieve controlled temperatures ranging from 1500 to 7000 degrees Celsius, high enough to melt the fibers that make asbestos unsafe, along with the asbestos-containing materials, he explains. The resultant chemically inert glass-like solid residue is not considered to be asbestos and can be taken to any disposal site.

Item: Another hazardous material that has only recently been revealed as a nationwide problem in buildings is lead-based paint. The level of lead in the blood deemed "safe" is steadily being lowered as new research results are revealed. The neurological injury to children has been shown to be especially severe, not only from eating peeling paint chips, but also from contact with airborne lead dust. The hazard is there, and it is wide-spread—but how can lead be efficiently and economically detected in paint and how can it be safely removed or encapsulated?

To assist in determining the research needed to solve the problem of lead paint abatement, CERL again turned to the Construction Research Center and GTRI. Jan Gooch, like Villalobos a researcher in the Materials Science and Technology Laboratory, has taken on this task.

CRC Gets Large Contract Awards

These are the first two research projects undertaken by GTRI scientists in collaboration with CRC, but the potential exists for many more, Circeo says. CERL recently awarded the Center two large indefinite de-

President John P. Crecine and members of his staff visited the acoustics and aerodynamics facilities at GTRI—Cobb County in July. Shown from left to right: Charles Brown, Laboratory Group director; Bob Cassanova, Aerospace Lab director; Krish Ahuja, Acoustics Branch head; Demetrius Paris, vice president for Research and Graduate Programs; Joseph Gilmour, vice president for Strategic Planning; President Crecine; GTRI Director Don Grace; Charles Crawford, Aviation Technology Branch head; Bob Englar, Aerospace Lab senior research engineer; Ed Reedy, GTRI associate director and Laboratory Group director. (Photo by Anita Edwards)
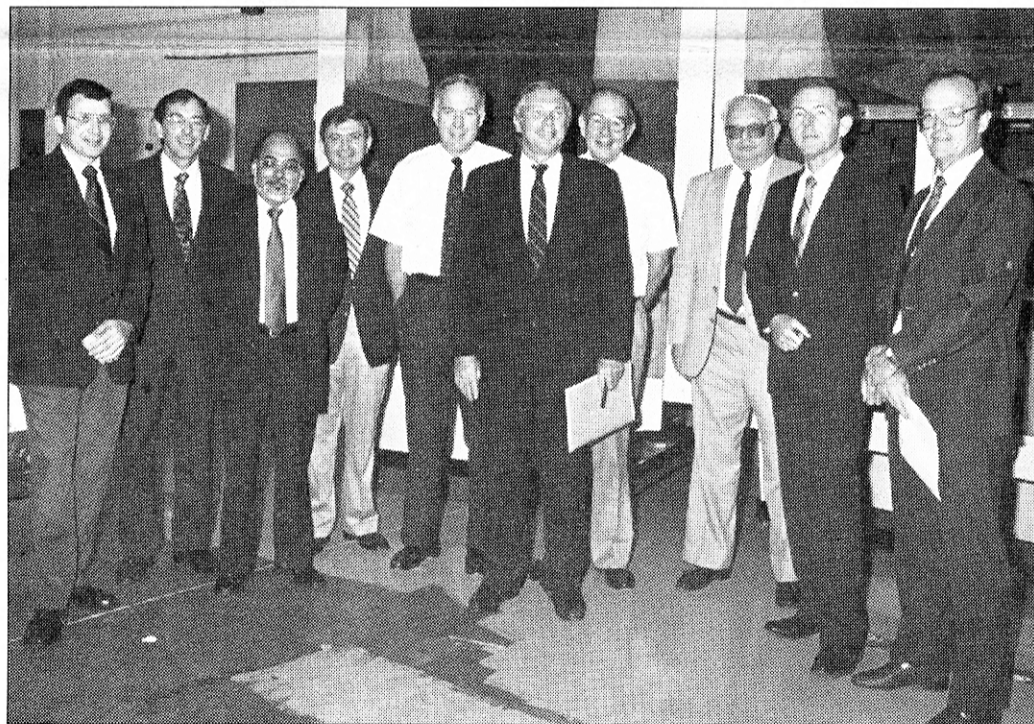
Observed & Noted

Ben James went to India this summer to evaluate that country's industrial extension services. *Read his impressions on page 2.*
■

It's time to think about the annual GTRI Research Awards again. *Learn how to nomi-* *nate someone on page 2.*
■

ASTL? MATDL? RIDL? What do they represent? STL? That doesn't mean what it used to mean. *To find out, see your guide to the new GTRI alphabet soup on page 3.*
■

Everything you ever wanted to know about desktop publishing but were afraid to ask. *Read it on pages 4 and 5.*
■

The University System's central office is doing it. The University of Georgia is doing it.

And Georgia Tech is doing it. *To find out what they're doing and why, turn to pages 6 and 7.*
■

You'll find *Professional Activities* on page 3 this month.
■

Questions, Anyone? is back after a couple of months' vacation. *To see what Charles McCullough has to say, look on page 5.*
■

William S. Rogers, Jr., has joined the Concepts Analysis Lab as head of the Integrated Effective-ness Branch. *Read all about him and other news of the GTRI family on page 8.*

News & Notes

Construction Research
Continued from page 1

livery contracts based on proposals CRC submitted that identified more than 100 faculty members at Georgia Tech with expertise in CERL's areas of research concern. Some two thirds of these experts are in GTRI.

One contract, for $2 million over a 24-month period, is to provide research support in the area of facility life cycle processes and related studies. CERL may issue task orders in 21 technical areas relating to computer-aided engineering and architectural design, habitability studies, facilities engineering management, computer and information technologies, military engineering, military programs analysis, and construction management. Dr Circeo is program manager.

The other contract, for $500,000 and 24 months, is for research support in the area of engineering materials and related sciences. Major thrust areas are corrosion and coatings, metallurgy and quality assurance, engineering studies, construction and maintenance, electromagnetic pulse, and polymer applications. This proposal was submitted jointly by CRC and the former Energy and Materials Sciences Laboratory of GTRI. Dr. Circeo is program manager and Dr. Daniel J. O'Neil is program coordinator.

The Construction Research Center has submitted another $2-million proposal to supply research support in the area of environmental engineering and related sciences. If awarded to Georgia Tech, the Environmental Engineering Branch of the School of Civil Engineering will be the principal academic unit and the Environmental Science and Technology Laboratory will be the principal GTRI unit conducting research under this umbrella.

The indefinite delivery contracts grease the wheels for research activity, but they don't deliver the funding for actual research projects, Dr. Circeo points out. "For that, the researchers at Tech need to beat the bushes at CERL to find out what their specific needs are, then work with CERL researchers to develop 'white papers' to carry out the required tasks." Researchers interested in pursuing this opportunity should contact Dr. Circeo at the Construction Research Center (894-2069) for further information.

> *"Researchers at Tech need to beat the bushes at the Construction Engineering Research Laboratory to find out what their specific needs are, then work with CERL researchers to develop 'white papers' to carry out the required tasks."*
> — Louis Circeo

Construction Research Center

The Construction Research Center is one of three research centers in the College of Architecture. (The other two deal with architectural conservation and rehabilitation technology.) A nationally recognized research facility to support the U.S. building industry in all aspects of construction technology, it opened in 1987 with the hiring of Dr. Circeo under a senior faculty research leadership grant. It draws upon the resources of the entire university for its program of research, technology transfer, information dissemination, and education and training.

Georgia Tech started the Center in response to concern over the U.S. construction industry's continuing decline in productivity and competitiveness in the international arena. A study by the Business Roundtable, composed of the chief executive officers of 200 of the largest industries in the U.S., concluded that among the major problems of the fragmented construction industry were an inability to identify its needs and to translate them into research requirements, plus an inability to transfer research results to commercial application.

"The U.S. construction industry makes up about 10% of the gross national product —by far the largest industry in the country," Dr. Circeo says, "but employee productivity in the industry has declined about 30%, back to levels achieved in the 1950s." One result of this, Dr. Circeo points out, is that U.S. construction firms' share of new contracts on the international market declined 40% between 1982 and 1986. "Even in the United States today, a significant amount of the new construction is done by Japanese firms," he says.

Circeo also notes that the U.S. construction industry lags in research. "According to *Business Week*, construction has the lowest R&D investment as a percentage of sales of 11 major industries in the country," he says. In addition, the time it takes to commercialize successful products of construction research is unconscionably long—more than 15 years in the United States as opposed to four to five years among the United States' Asian and European competitors, he reveals. "Construction technologies developed in the United States by American scientists are very likely to be commercialized and put into practice by foreign competitors long before they are in standard use by the U.S. construction industry," he says.

Several government organizations are working with universities to improve state-of-the-art construction research, most notably the U.S. Army's Construction Engineering Research Laboratory (CERL). Co-located with the University of Illinois, CERL is by far the largest construction research lab in the U.S. Through a variety of task order arrangements, CERL actively works with over 30 major universities in conducting research to support Army needs. It is recognized throughout the government as an innovator in the transfer of technology to users in both the governmental and private sectors. It has four research divisions: Engineering and Materials, Energy Systems, Facility Systems, and Environmental. Dr. Circeo was director of CERL from 1979 to 1983. ❏

Wanted: Exceptional people

Do you have exceptional personnel working in your laboratory or department? Then get ready to suggest their names to your lab director or department manager for nomination for the 8th Annual GTRI Research Awards. They must submit their official nominations to the Research Awards Review Committee by October 3.

This year the awards categories have been changed to reflect the reorganization of GTRI and to give each employee a fair chance to win an award. The categories and the number of awards are as follows: Research (3), Junior Researcher (1), Program Development (3), Management (1), Project Director (2), Research Support as a Classified Employee (3), Research Support—Open (1), Graduate Student (1), and Undergraduate Student (2). Awards program guidelines and procedures for 1990 will be available from your lab director or department head.

Charlene Bayer (ESTL) chairs this year's Awards Review Committee. Other committee members are Harold Engler (CAL), Linda Harkness (RSAL), David Millard (EEEL), Harry Ross (RPMD), and Bill Howard (OOD—ex officio/nonvoting). ❏

'Gunga Ben' looks at industrial extension in India

By Lincoln Bates, ESTL

Ben James, a veteran of GTRI's industrial extension and education efforts, spent six weeks this summer in India as a scout for the World Bank. With a Canadian consultant, he performed a preliminary survey and evaluation of India's industrial extension services.

The statement of work, he says, involved (1) investigating and documenting the range of industrial extension services for small-scale industries, (2) gathering data on the effectiveness of these services, and (3) recommending further areas of study.

"Originally, they wanted a 10-page report of preliminary data, but later changed that to a full-blown report of 40 to 50 pages," says James. The report, he adds, will give the World Bank baseline information to design a broad study of India's small-scale industry and its problems. "We may be asked to return and assist in the larger study," he says.

The secretary of the Ministry of Industry arranged for the team to visit five of 27 federal centers—in Bombay, Bangalore, Delhi, Madras, and Calcutta—that serve the country's small-scale industry. The director of each center, in turn, arranged meetings with representatives of other industrial extension sources in his region, such as banks, state agencies, and trade associations.

To counter the possibility that much of the tour was staged, the team, when it returned to Delhi, met with several industrialists without the presence of government officials.

James declines to discuss findings until the World Bank receives and reviews the report, but he does note that it's difficult to compare industrial extension activities here with those in India, where numerous layers of bureaucracy contribute to inertia. Also, roads and the communications network are not in great shape, conditions that can affect industrial extension efforts anywhere. And, he observes, there's a shortage of critical materials because the government is limiting imports and allocating materials to help control the country's balance of payments.

Most employment in India remains in agriculture or agribusiness, but, says James, industry has accelerated recently. Employment in the small-scale sector, for example, has grown by 12% over a four-year span. (India defines small-scale industry solely in terms of investment in machinery and equipment. It has nothing to do with land, buildings, or number of employees, James says.)

James and his colleague were warmly received. "The temperature was 116 degrees when we arrived. Later, the monsoons started, which lowered the temperature to 95, but the humidity was 95%."

In the lasting-impressions department, he says, "The traffic was horrendous. There seem to be three motor scooters for every person in India, and you spend a lot of time dodging cows." ❏

Professional Activities

Computer Science & Information Technology Lab

Jeff Grover recently participated in a review of proposed changes to the Ada programming language. Organized by the National Computer Security Center, the forum dealt specifically with the information security and data integrity implications of the proposed language changes. Forum attendance was limited to 10 invited members of the Ada Run Time Environment Working Group. Results of this review will be submitted to the Ada 9X project office.

Countermeasures Development Lab

David Flowers, Tom Pratt, Jack Landgren, and **Armand Masse** presented briefings at the Crossbow-S Symposium on Monopulse Countermeasures (CM) in Huntsville (AL) July 17-18. The briefings were based on results obtained from contracts on the Semiactive Monopulse Missile CM, the Cross-Polarization ECM Study, and the Phased Array Vulnerability Estimate.

Economic Development Lab

Charles Estes has been appointed to head a joint committee between GTRI and the Department of Technical and Adult Education to investigate ways the two groups can work cooperatively.

John Mills was elected treasurer of the Georgia Society of Professional Engineers at its annual meeting in June.

Georgia has received chapter status in the Technology Transfer Society, according to EDL director **Dave Swanson**.

In early July, **Susan Griffin** and **Bob Springfield** attended a strategic planning workshop in La Jolla (CA) which focused on how to lead an executive group through a strategic planning process. They plan to impart these techniques to both internal and external audiences.

In mid-August, **Art Brown** attended an advanced symposium at the University of Oklahoma's Economic Development Institute and took the Certified Industrial Developer examination.

Electro-Optics Lab

Gary Gimmestad attended the 15th International Laser Radar Conference July 23-27 in Tomsk, USSR, and presented three papers: Sky Radiance Measurements and Cloud Characterization," coauthored by **C.E. Vaughn**; "Development of a 1.54-Micron Eyesafe Raman-Shifted Lidar for Cloud and Aerosol Studies," coauthored by **E.M. Patterson**; and "Atmospheric Density and Temperature Measurements Using MEGALIDAR," coauthored by **Allen Garrison, Jim Cathcart, David Roberts, Gerald Grams**, and Patterson.

Nick Faust was invited to the Stennis Space Center to participate in the fourth meeting of the National Center for Geographic Information and Analysis Initiative 12—Remote Sensing and GIS. This working group is tasked with defining research issues in the integration of remote sensing into geographic information systems of the future. Faust is responsible for defining topics associated with future computing resources and visualization of multidimensional data.

Electronic Support Measures Lab

At the Government Neural Network Appli-

cations Workshop in San Diego August 29-31, **Katherine Schlag** will present a paper entitled "Neural Networks Applied to Intrapulse Pattern Recognition."

Environmental Science & Technology Lab

At the International Conference on Indoor Air '90 in Toronto last month, **Charlene Bayer** presented two papers: "An Investigation into the Effect of Building Bake-out Conditions on Building Materials and Furnishings" and "Exposure Assessments of Volatile Organic Compound Emissions from Textile Products."

Steve Hays presented the Trenching and Excavation Awareness Program at Southern Tech July 18. Also in July, he received designation as a Certified Safety Professional.

Huntsville Research Lab

Barry Bullard presented a paper entitled "Rotary-Wing Radar Signature Analysis" at the Innovative Anti-Air Weapons Systems Conference held in late June at Johns Hopkins University's Applied Physics Laboratory in Laurel (MD).

Modeling & Analysis Lab

Members of MAL were quite active at the International Radar Conference in Washington (DC) in May. **Marvin Cohen** presented a three-hour invited short course on "Pulse Compression in Radar Systems," and **Charles Brown** (OOD) presented "Principles and Applications of Millimeter-Wave Radar." Dr. Cohen chaired the technical session on Radar Signal Processing and was coauthor of "Optimal Peak Sidelobe Filters for Biphase Pulse Compression," presented by **Michael Baden**, as well as "Minimum Peak Sidelobe Pulse Compression Codes," a poster presentation made by **Marshall Fox. Jeff Holder, George Brown**, and **Jim McClellan** (EE) presented "A Phased-Array Calibration Technique Using Eigenstructure Methods."

At the Annual Tri-Service Radar Symposium in Monterey (CA) in June, Dr. Cohen presented a paper, "Model-Based, Multi-Sensor Aircraft Recognition," coauthored by **Jim Cathcart** (EOL) and **Vincent Sylvester. Jill Butterfield** presented "Applications for Fractal Geometry Techniques to Radar Detection of Stationary Targets in Ground Clutter."

An article by **Jeff Holder** and **Vincent Sylvester**, "An Analysis of Modern versus Classical Homing Guidance," appeared in the July issue of the *IEEE Transactions AES Journal.*

The July issue of the *Journal of Electronic Defense* featured an article by **Marvin Cohen** on "Target Recognition for Autonomous Smart Munitions."

Radar & Instrumentation Development Lab

RIDL presented two continuing education short courses in late July: "Principles and Applications of MMW Radar," administered by **Charles Brown** and **Evan Chastain**, and "Radar Reflectivity Measurement: Techniques and Applications," administered by **Nick Currie**. Lecturers from RIDL, RSAL and MAL included **Jim Scheer, Bob Trebits, Ben Perry, Jim Kurtz, Wayne Cassaday, Archie Corriher, Maurice Long, Mike Tuley, Sam Piper, David Galloway, Gene Martin, John Trostel, Gene Greneker, Lamar Gostin, Jim Echard, Bill Holm, Bob McMillan, Tracy Wallace, Joe Bruder, Guy Morris, Charles Brown**, and **Nick Currie**. Others involved in the course were **Joe Galliano, Jim Wiltse, Ed Joy**, and **Don Bodnar**.

Threat Systems Development Lab

TSDL personnel presented three papers at the 19th Power Modulator Symposium, held June 26-28 in San Diego (CA) and sponsored by the IEEE Electron Devices Society and several research laboratories of the military services. **George Ewell** presented "Protection of Medium-Power Pulse Klystrons," coauthored by **Tracy Wallace** of GTRI and E.W. McCune of Varian Associates; **Istvan Nogradi** presented "The Envelope Technique for Trigger Amplifiers"; and **Bill Dittman** (MATDL) and Nogradi presented "Cooling and Insulating Small Hard Tube Modulators." Some 300 delegates from the U.S. and eight foreign countries attended. ❏

Your guide to the new alphabet soup

Are you confused by the abbreviations for the new labs that you see? Here is a list to aid you. You may want to clip and save it for future reference.

Laboratories:
ATL = Advanced Technology Lab
ASTL = Aerospace Science & Technology Lab
COML = Communications Lab
CSITL = Computer Science & Information Technology Lab
CAL = Concepts Analysis Lab
CMDL = Countermeasures Development Lab
EDL = Economic Development Lab
EEEL = Electromagnetic Environmental Effects Lab
EMSTL = Electromagnetic Science & Technology Lab
ESML = Electronic Support Measures Lab
EOL = Electro-Optics Lab
ESL = Engineering Sciences Lab
ESTL = Environmental Science & Technology Lab
HRL = Huntsville Research Lab
MSTL = Materials Science & Technology Lab
MATDL = Microwave & Antenna Technology Development Lab
PSL = Physical Sciences Lab
MAL = Modeling & Analysis Lab
RSAL = Radar Systems Applications Lab
RIDL = Radar & Instrumentation Development Lab
STL = Signature Technology Lab
TSDL = Threat Systems Development Lab
Program Incubators:
AVF = Acoustics/Vibration/Flow Control
MFT = Manufacturing Technology
TPI = Technology Policy
Support Groups:
FMD = Facilities Management Department
HRD = Human Resources Department
ICG = Instrumentation & Calibration Group
MAPS = Management & Project Support Group
MSD = Mechanical Services Department
RAD = Research Accounting Department
RCO = Research Communications Office
RPM = Research Property Management
RSD = Research Security Department
SSD = Supply Services Department
Program Offices:
EWT = EW Techniques Analysis
SOF = Special Operating Forces
Field Sites:
DRO = Dayton Research Operations
EGO = Eglin AFB Research Operations
FMO = Ft. Monmouth Research Operations
WRO = Warner Robins Operations

GTRI researchers recently journeyed to scientific meetings from Alabama to California— and even to the Soviet Union.

Desktop publishing: a tool for the research environment

By Stephanie Babbitt, ESTL

Desktop publishing technology is useful to researchers because it shortens the time required to typeset and prepare a document and because it allows for tighter security controls.

Desktop publishing (DTP) technology first became available for personal computers around 1986. Now, virtually everyone at Georgia Tech who has access to a personal computer or minicomputer has basic DTP capabilities. DTP means using a computer program to format and prepare a document for final printing (which can be anything from photocopying to four-color presswork). Users can choose DTP software ranging from high-end word processing programs (such as WordPerfect® or Microsoft Word®) to professional layout software (such as Page-Maker®, Ventura Publisher®, or FrameMaker®).

In the research environment, DTP technology is especially useful because it often shortens the time required to typeset and prepare a document. In traditional publication procedures, the client submits typewritten, proofread text to a typesetter, who has to re-key the text on a typesetting machine. The client then has to proofread the text again before layout. After layout, another proofing session is necessary. DTP can, in many cases, eliminate the typesetting step and several episodes of proofreading, often saving a week or more of production time. The technology allows for tighter security control, because fewer people need to handle the document. DTP also gives the user close control over the appearance and content of a document. This feature can be a mixed blessing!

As with any technology, some people will use DTP wisely, and some people will abuse it. I have seen some highly professional multicolor pieces produced here at Georgia Tech using DTP systems. I have also seen some abysmal work that is difficult to look at for more than a few seconds, let alone read. DTP software cannot instantly make a person into a designer any more than accounting software can instantly make a person into an accountant. Anyone who expects to use DTP technology productively must have adequate training both in the principles of design and typography and in the use of the computer/software platform that he or she will use. Rule of thumb: If you can tell it was done on the desktop, it's not good enough!

A DTP case history

In the Environmental Science and Technology Laboratory (ESTL), we have used DTP since 1987, when we acquired PageMaker 1.0 for MS-DOS. At the time, we had no idea what we had let ourselves in for! In the early months of DTP, we found that a Ph.D. in microcomputer technology would have been more useful than our publishing backgrounds. Endless hassles with memory allocation, font installation, network conflicts, ad nauseam almost caused us to give up on the technology. Ultimately, we decided that we were not productive enough using MS-DOS with its 640 K barrier and cryptic expanded/extended memory configurations, and we switched to Macintoshes.

Fortunately, ease of use has improved dramatically on most platforms since that time. We are still happily using Macintoshes, but we know of people both on- and off-campus that use DTP successfully on MS-DOS and UNIX machines. Microsoft Windows 3.0® and OS-2 are reputed to break the 640 K barrier that made DTP so difficult for us on MS-DOS (but they both require at least 2 MB of RAM and operate better with 4 or more MB). UNIX is an excellent DTP environment for those who are comfortable with the user interface.

In addition to our Macintoshes, we in ESTL use 300-dpi Apple Laserwriter (PostScript) printers, and a grayscale scanner. We also have a TOPS network linked to an MS-DOS machine and an external MS-DOS diskette drive so we are still compatible with other computers in the Lab. With this arrangement, we produce a number of regular newsletters, including *Environmental Spectrum, Industrial Advisor, Conserver, Economic Development Research Focus*, and *PoultryTech*. We also produce flyers, brochures, proceedings, final reports, and a variety of other works. We do all the typesetting and most of the graphics for these publications in-house; in fact, we produce *PoultryTech* 100% on the computer (including photographs). We submit our publication files on diskette or via Ethernet to the Printing and Photographic Center (PPC) for output to a 2,540-dpi imagesetter (which produces output comparable in quality to traditional typesetting). From this machine, we get our film negatives, which PPC (or another printer) uses to create plates and print the final work.

Because we create our publications on the computer, we have the security of knowing exactly how they will look before we ever see the print shop's test runs.

One of the major reasons we can be so confident in our final results is because we use Adobe PostScript® printers, graphics, and fonts. I have seen any number of people expect to turn out great-looking work just because they have some DTP software and a laser printer. Unfortunately, many laser printers do not produce the type of output their owners expect. The HP Laserjet Series II® and its compatibles, for example, have disappointed many prospective publishers. Because all of its output is based on dot patterns (or bitmaps), this type of printer requires cartridges or soft fonts to produce more than the barest minimum of typefaces, and its graphics tend to look jaggy. PostScript, however, uses scalable fonts and mathematically calculated graphics. A program sending a file to a PostScript output device doesn't say, "Put a dot here and another dot there." Instead, it says, "Draw a line 1 point wide beginning at 123:471 and extending to 24:650." This output technology is device independent, so that the placement of each element on the page will be exactly the same from the 300-dpi Laserwriter as from the 2,450-dpi imagesetter.

Recent announcements from Apple and Microsoft about TrueFont/Royal printer technology have indicated that PostScript soon may have some serious competition. In addition, HP has introduced a scalable-font printer, the Laserjet Series III®. While this printer demonstrates impressive font-handling capabilities, it still does not boast the graphic support of PostScript. For now, the huge installed base of PostScript output devices (particularly at service bureaus and print shops such as PPC) makes it the technology of choice.

What about scanning?

PostScript's superior graphics capability has given me the freedom to experiment with one of my favorite technologies: grayscale scanning. Early one-bit scanners captured only black and white, much like a photocopier. Now, most low- to mid-priced scanners capture eight bits of information per sample, allowing them to detect up to 256 shades of gray. This is about as many as most people can discern, so it is adequate for scanning photographs for inclusion in publications. Most publishers are not comfortable with this application yet, preferring to stick with the more proven technology of traditional press halftones. However, after considerable practice, I have been able to use the

The author used a scanner and an image-editing program to salvage the photo she wanted by electronically opening the scientist's eye. The photo at left shows him with his eye closed, and the altered photo at right shows him with it open. (Photos courtesy ESTL)
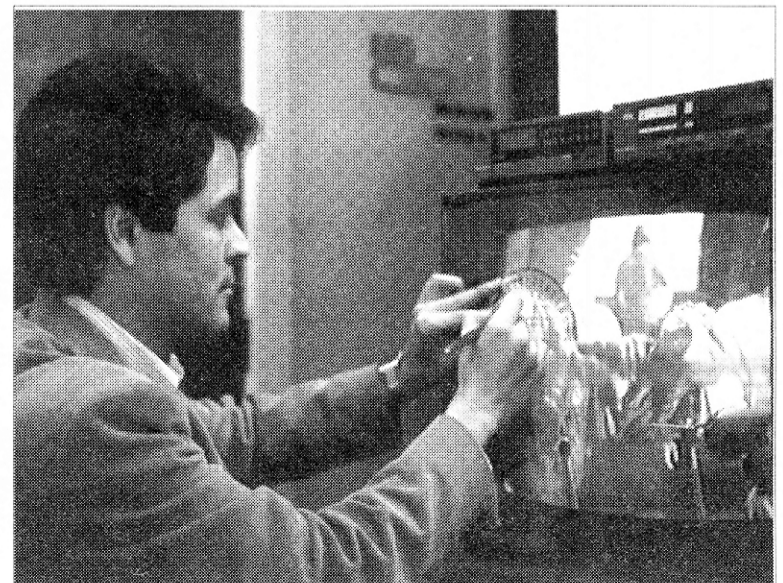
manipulative capabilities of PostScript to produce traditional-looking halftones right at my desk.

To me, the greatest advantage of scanning is being able to import a photograph into an image-editing program and clean it up. I don't recommend this approach for everyone, because it is time-consuming and requires inordinate patience. However, the technology lets me use photographs that illustrate my topic but have a major flaw. For example, the photo on the front page of the Winter 1990 *PoultryTech* shows a scientist sitting at a monitor, reviewing a videotape taken at a poultry processing plant. Only one shot off the roll showed the scene I wanted on the monitor, but the scientist had his eyes closed. Rather than settle for a lesser shot, I scanned the one I wanted, imported the scan into a grayscale editing program, and opened the scientist's eye!

In addition to grayscale scanning, we use our scanner to capture line art and grayscale images for re-drawing or tracing in one of our graphics programs (keeping copyright considerations in mind, of course!). We have also had some success with optical character recognition (OCR), although the accuracy still isn't quite what we'd like it to be. Over time, we have tested two types of OCR packages: pre-trained, which recognizes a few fonts in limited sizes; and intelligent character recognition (ICR), which can recognize almost any font in any size. The pre-trained wasn't even worth the time or money. The ICR has been useful, but it is slow, and the software is very expensive. However, when the boss needs a copy of a 40-page report on disk, and the last version was created on a dedicated word processor that went to State Surplus two years ago, the software is wonderful to have around!

Overall, DTP technology has improved tremendously since we first ventured into its uncharted waters in 1987. We in ESTL are able to produce high-quality publications and graphics right in the office, and we are more valuable to our Lab as a result. One word of caution: the DTP skills we have did not come easily. We spent hours (often on our own time) learning to use our software, and we must practice constantly with a variety of different programs to keep our skills sharp. We produced dozens of marginal-to-awful drafts of our early publications before we were able to show anything close to traditional quality. We have learned the hard way about the vagaries of automatic page numbering, color separation, and halftone line screens as rendered by an imagesetter. Most important, out of necessity we have truly mastered our computers, becoming "power users". For us, the struggle has been worth it; the payoff has come in the control we have over the appearance and quality of the material we produce.

Next month: Ten Tips for Productive Desktop Publishing ❏

By Charles McCullough, HRD

Now that you've explained what happens to benefits when an employee goes on a reduced percentage of time, explain one other thing: How is my salary calculated at a reduced percentage when only a partial month's salary will be paid?

It depends on the pay cycle on which you're paid. For biweekly-paid employees who are paid for a partial pay period at a reduced percentage of time, there is nothing complicated (or even mysterious) about the process. A biweekly-paid employee just reports the number of hours worked each day whether it's eight or four or one; and for every hour reported on their time sheet, they get compensated at their hourly rate of pay. It's eerily straightforward and simple.

In marked contrast, however, the salaries of employees paid on the fiscal pay cycle (the one where you receive one check a month at the end of the month) have nothing to do with what's reported on the time sheet. Salary calculations are treated entirely differently when a reduced percentage of time is in effect, that is, when the employee will be paid for only part of the pay period (with the pay period being the same as the calendar month).

What invariably confuses fiscal-paid employees is that THE COMPUTER assumes that an employee working at a reduced percentage of time works that reduced percentage each and every day. If you are working at 80% time, you might logically work four days per week. But THE COMPUTER bases its output by making the irrevocable assumption that you work 80% of each compensable day or precisely 6.4 hours per day five days a week.

For months during which a fiscal-paid employee will be paid for only part of the month (for example, the start of a leave of absence without pay), you must match THE COMPUTER's calculations and apply the reduced percentage of time to the less-than-whole portion of the month in order to determine pay for that month. Since we're making a lot of assumptions here, let's assume that you are fiscal-paid, earning $36,000 per year if at 100% time ($3,000 per month). Let's further assume that you are currently at 75% time (so you're actually being paid $2,250 per month) and that you are going to begin a leave of absence without pay. Your first day in an unpaid status is Monday, 13 August 1990.

August 1990 has 23 compensable days and you will be working for only eight days (1-3 August and 6-10 August), so you will be paid for 8/23 of the month or 34.78%. Since you're at 75% time, you'll be paid for 75% of that 34.78% or 26.08% of your full-time salary of $3,000 per month: 26.08% of $3,000 = $782.61.

If you're really perceptive, you'll notice that the number of business days in the month has a very direct impact on these calculations. If that same $36,000 per year fiscal-

paid employee works only eight days in February 1991 while at 75% time, the calculations would be as follows: 8/20 of the month = 40% of the month; 40% of ($3,000 x 75% time) = $900. Why the big difference between the dollar amount of eight days in August 1990 versus eight days in February 1991? Because all fiscal-paid employees' salaries are first and foremost based on the monthly rate; therefore, the dollar worth of a work day in a short month is greater than the dollar worth of a work day in a long month.

What would happen if a fiscal-paid employee at 75% time worked eight hours a day during the first 75% of the month and then terminated at the 75% mark? If you said he'd get his full 75% pay, you flunked. In order to get his full 75% of a month's salary, he'd have to be in our employ for 100% of the month (100% of 75% = 75%). If he terminated three-quarters of the way through the month, THE COMPUTER will pay him for only 75% of 75%, or 56.25% of the month's salary he'd earn if at 100% regardless of his eight-hour-a-day effort for 75% of the month. The only thing that reporting 75% on the final time sheet would do would be to require the preparation of a revised time sheet showing 56.25% because time sheets do not create pay for fiscal-paid employees; only THE COMPUTER creates pay and then only according to whatever it has been told by a Personal Services Form.

Before you start arguing with these figures because you ran them on a mainframe that calculated everything to 341 digits to the right of the decimal, keep in mind that all payroll calculations are performed using only the first two digits to the right of the decimal. Payroll calculations are neither rounded up nor rounded down.

While these examples involve an employee starting a leave of absence without pay, the same general rules of math would apply for any other situation in which an employee at a reduced percentage of time will only be paid for part of a month, such as a termination or even an employment action if the employee was starting off at something less than 100% and the first day of work was a day other than the first business day of the month.

Personnel Tip of the Month: Long-time readers of "Questions, Anyone?" may remember the first topic ever covered in this column: how to check your social security record to ensure that your earnings are being accurately credited to you. Financial experts have long advised that all wage earners should check their social security account at least once every three years.

Nowadays, investigating the state of your social security account is simpler than ever. Just call 1-800-234-5772 and request a "Personal Earnings and Benefit Estimate Statement" form. When you receive the form, just fill it out and mail it in. In about a month, you'll receive your statement from the Social Security Administration. Look it over carefully. If you have any questions about what's shown on that form, call the telephone number shown on the form for further information. Last year, the Social Security Administration received nearly 10 million requests for this form and, out of those, between 70,000 and 75,000 involved discrepancies. ❏

Georgia Tech shows environmental awareness

By Kathie Coogler Prado, CAL

This year, the 20th anniversary of Earth Day, the people at Georgia Tech have joined the citizens of the world in taking a hard look at what the future holds. Many environmentally concerned people at Georgia Tech say that it was the activities surrounding Earth Day that motivated them to do their part toward solving the problems that plague the planet.

Some of the most prevalent problems brought out during Earth Day activities are:
• Depletion of the ozone layer,
• The greenhouse effect,
• Water pollution,
• Air pollution,
• Deforestation, and
• Overuse of landfills.

The issue of deforestation is not a small one. An abundance of forests is necessary in managing water drainage, controlling the greenhouse effect, and providing clean air. (In fact, the Amazon rain forests are often referred to as "the lungs of the world.") Deforestation and wasted tree products, on the other hand, contribute to these problems.

Tree products have become an American way of life, and doing without them won't be easy. But if the current rate of cut and consumption continues, it has been estimated that there will be no old growth forest left in the U.S. in five years. Without trees, not only will our way of life be diminished, the future of the planet will be bleak.

Changing habits

The Georgia Tech community is doing its part at home and at the office to help solve one of the nation's most critical problems: waste management. Individuals within GTRI are reporting that they are taking action by changing their personal habits. Some of the things they are doing to contribute in their own way are described below.

In the area of product choice, many people such as Laurie Tucker are making a concerted effort to buy recyclable or recycled products such as recycled writing paper and

"For every ton of office paper we recycle, we can save 29 trees, 410 gallons of fuel, and eight cubic yards of landfill space."
—Recycall Consulting Services

greeting cards made from this paper.

Another change in preference is in choosing colors. Kathryn Gilbreath reports that white paper, for instance, requires an extensive bleaching process that requires chemical processing to purify the water used. Even with thorough processing, bleaching adds to the water pollution problem. Other colors require dyes. Beige is the natural color of paper products. So the products of choice are now beige writing paper and beige toilet paper.

Although grocery stores are offering shoppers their choice of evils (plastic versus paper bags), some people are beginning to provide their own grocery bags when shopping. This requires no recycling at all and is the norm in Europe.

Many individuals at GTRI are reporting that they have installed garbage separators at home. What are they doing with it all? Some are changing from garbage collectors to waste management services. For a small fee, such as $12 per month, their personnel deliver color-coded reusable drawstring bags and pick up both regular garbage and recyclable items. At the end of each year, the customer receives a check based on the amount of material recycled.

Other people are gathering up their goods and delivering them to recycling centers. Employees such as Ann Dunehew are contributing their recyclable products to charitable efforts sponsored by church groups, whose receptacles are located in the church parking lots. Still others are contributing their recyclable products for community improvement projects, whose receptacles are typically found at local fire stations.

Conscientious employees

GTRI employees save as many trees as possible by utilizing their electronic mail system (PROFS network), circulating their rough draft reports electronically instead of on paper, and by separating their recyclable products from actual garbage. Boxes are cropping up in photocopy rooms and in individual offices. But what next? Where can it go from there?

Carl Baxter, manager of the Cobb County Research Facility, circulated a questionnaire concerning recycling at his facility, also in response to activities surrounding Earth Day. He says, "There were so many individuals talking about the importance of recycling that I felt that we could make a difference in our community." More than 200 people at CCRF responded to his questionnaire, indicating that they would participate in a program; and 28 people said they would volunteer to help

run the program. So he gathered data on his own time about recycling. Baxter also wrote the Environmental Protection Agency for ideas on how to meet the demands of his facility.

The volunteers held a meeting during lunch on August 3 to discuss the pros and cons involved with recycling. They agreed that the key is to make it convenient for everyone, but not an eyesore. Another important factor brought out was that sorting should not overburden people. Other issues included making it known why recycling is necessary and what the benefits of recycling are. One of the attendees commented: "No selling is necessary for individuals in our organization. We understand the need. Let's just figure out what to do and set it in motion." ❏

Georgia Tech to start recycling pilot program

(EDITOR'S NOTE: The following article is based on a telephone interview with John Stone, Director of Property Control for Georgia Tech, by Kathie Coogler Prado)

Georgia Tech will begin a paper recycling program this September. The first three buildings to participate will be the Carnegie Building, the Administration Building, and the Library. As funds are generated, other buildings will be brought into the program.

"The concept of recycling is not new to the state or the University System," says John Stone, director of Property Control at Georgia Tech. He says Property Control has always recycled such items as metals, tires, and batteries. In fact, all used equipment is transferred to the state warehouse, to other state agencies for further use, or sold at auction. Everything purchased on campus with Georgia Tech funds must be handled and disposed of by Property Control.

Until now, paper has been nothing more than garbage, and has been disposed of as garbage by state contractors. The main deterrent to paper recycling in the past has been that "it wasn't cost effective" in terms of man-hours required to handle it versus the return, Stone says. The return is thought of in terms of the dollar amounts required to dump it versus managing it.

Paper is a small item by itself; but the amount of waste produced by a major university is more than a mammoth mound, and it is regularly generated. The amount of effort needed to get this volume of paper waste recycled requires more manpower than the Property Control office has had available, says Stone.

Paper recycling at Georgia Tech through Property Control became a possibility more than a year ago when students involved with the Environmental Forum came to Stone. They offered to volunteer their time on a paper recycling project, thus making available the manpower required to get the effort off the ground.

Three different companies were called and questioned about the methods and costs involved with the endeavor. Stone chose Recycall Consulting Services because its system is simpler and its personnel will train in-

Mountains of paper: In a storeroom in the basement of CRB, (left to right) Lee Evans, Tom Jones, and Mark Foreman display bins of paper collected for a GTRI recycling pilot project. (Photo by Joe Schwartz)

dividuals involved in the program.

The training provided by Recycall Consulting Services involves separation of paper. At this time, this company will take only computer paper and white bond because of the amount of fibers they contain. Newspapers, for instance, have the least amount of fibers and are of no value to the company. Colored paper is also unusable.

Georgia Tech will purchase the recommended desktop sorters and distribute them to individuals, according to Stone. This is how the system will work: Computer paper must be placed in one sorter and white bond in the other. When they are full, the individual will be expected to take the sorters to the appropriate intermediate containers, which will be centrally located. Custodians will empty these containers into "Ottos" (Recycall Consulting Services' container). The Ottos will be located outside each building so that Recycall Consulting Services can pick them up and leave empties. The company will make as many pickups as necessary to keep the space available for more input.

If Recycall Consulting Services personnel find more than 2% contamination in their Ottos, then the effort and money used to collect the material is wasted; they won't process the entire container because of the man-hours required to separate the paper.

Of course, if the program ever generates a profit, the money will be returned to the system either to encompass other kinds of paper for recycling or for similar endeavors.

The project to begin in September will be on a pilot basis. Before it can be considered a permanent activity, Stone says, "It must become self-supporting, that is, it must break even. It can't cost the state money." He feels that conditions in the current marketplace make breaking even possible, especially with the volunteers from the Environmental Forum here on campus. However, "the only thing that could hold the program back or cancel it would be if individuals don't cooperate."

The main question is: Will everyone become involved and cooperate? Eventually, everyone who uses a desk at Georgia Tech will have a desktop sorter, and it will be up to each individual to use it. ❑

GTRI to cooperate in recycling program at Tech

The Cobb County Research Facility (CCRF) will cooperate in the Georgia Tech paper recycling program, says facility manager Carl Baxter. Volunteers will begin collecting white and computer paper in September. Until the facility is brought on line with the campus pilot program, hopefully within a couple of months, the paper will be stored. Baxter has been conducting an aluminum can recycling project for several months.

A small pilot project on the fourth floor of the Centennial Research Building, begun in January by members of the Electronic Support Measures Laboratory, will continue. Mark Foreman, who spearheads the CRB pilot project, says they recycle all kinds of paper and cardboard. In addition, Tim Strike has started a program to recycle aluminum

cans. Facilities Management manager Tom Jones says the paper collected is being stored temporarily in a basement storeroom off the low-bay area until it can be hauled away by Recycall, the company chosen to handle Georgia Tech's paper recycling. Since January, over 8,000 pounds of paper and cardboard have been collected.

Jones has set up a sub-budget for monies earned from recycling as a kitty to buy recycling bins. "We can't expand right now," Jones says, "because of the startup costs of purchasing collection containers. They can't be purchased with state money. Small pilot projects can get by with makeshift containers, but to go building-wide or GTRI-wide, we need to buy a sufficient number of aesthetically attractive containers so that they will be conveniently located and not an eyesore." But eventually all campus buildings will be brought into the Georgia Tech recycling program.

According to Recycall, approximately 54% of the waste generated in the average office is white paper and computer paper. These are the items they will handle. They say, "For every ton of office paper we recycle, we can save 29 trees, 410 gallons of fuel, and eight cubic yards of landfill space. Not only does recycling produce energy savings of 32-74%, it also lowers air pollution by up to 74%."

Mark Foreman explains that computer paper should be separated from white paper (paper from a laser printer or photocopier) because the ink is much easier to remove from computer paper and it commands a higher price. As for newsprint, it is the lowest grade of paper, composed of very short fibers. ❑

Want to get involved? Here's how to pitch in

The Environmental Forum of Georgia Tech is a student-led organization that includes participation by faculty, staff and Physical Plant representatives. It has a small recycling site on the parking deck side of the Student Center with separate bins for glass, aluminum cans, and white and computer paper, and has been trying to obtain a larger site.

Started two years ago, the Forum has an active recycling committee that is working closely with the Tech administration on campus-wide paper recycling plans. According to student Matt Bruner, they also are assisting the campus landscape architect, Paul Vanderhorst, in an investigation of setting up bins in all the campus office buildings to collect aluminum, plastic and glass.

The Forum will resume its weekly meetings fall quarter, and all interested persons are invited to participate. The group will meet every Thursday at 11 a.m. in Room 331 at the Student Center. For further information or to receive their newsletter, call the Student Government office, send a note addressed to the Environmental Forum, or contact Todd Smiley, chairman of the recycling committee, at 874-6435 or at campus P.O. Box 37196.

Patrick Forest, station manager for WREK at Georgia Tech, is now airing the "Environment Show" weekly on Thursdays at 6:30 p.m. This show is broadcast from Los Angeles, California, and its emphasis is on both a national and individual scale. Reports in-

Carl Baxter has been running an aluminum can recycling effort at the Cobb County facility for several months. (Photo by Anita Edwards)

When the paper recycling program starts at Cobb County, participants will be asked to collect and separate their white and computer paper in folders like this one. (Photo by Anita Edwards)

clude what scientists and researchers are doing throughout the country to solve the environmental problems as well as what individuals are doing to improve the global condition.

In addition, Forest hopes to begin following the L.A. broadcast with local news of small, nonprofit groups and scientists at Georgia Tech who are involved with issues concerning the environment. If you would like to get others involved in your group's activities in solving the critical issues of waste management, you may have these activities announced on WREK. To do this, send the information to WREK for a public service announcement (PSA). The criteria for making a PSA can be obtained by calling WREK.

THE GTRI CONNECTOR would like to run a monthly column that circulates suggestions on how individuals can help solve the nation's problem of waste management. If you have any resource conservation ideas that can be put to use in the workplace or at home, please send them to KCOOGLER via PROFS. ❑

Focus on Folks

In July, several people were promoted and others were transferred to new GTRI units.

Personnel News

Advanced Technology Lab
Tony Gunther resigned on August 3.

Aerospace Science & Technology Lab
Bob Cassanova has moved to Cobb County to assume his new position as interim director of ASTL. His new secretary is **Frances Shiflett**, formerly of EMSL.

Mike Walker has joined ASTL as an RE II, coming from Lockheed—California.

Computer Science & Technology Lab
Janet Leininger has been appointed associate laboratory director to provide backup to the director and daily management of the lab.

Jeffrey Grover has been appointed chief scientist. His primary responsibilities will include management of program and development activities for new technology areas with particular focus on internal research, assistance in management of equipment resources to meet internal and sponsored program requirements, and recruitment and selection of research staff.

Concepts Analysis Lab
William S. Rogers, Jr., has been named head of the Integrated Effectiveness Branch. Before coming to GTRI in June, he served as program manager at the Aeronautical Systems Division of Wright-Patterson Air Force Base (OH). He recently retired as a lieutenant colonel after 23 years of service. He holds a BS and MS in electrical engineering from the Air Force Institute of Technology, and a BS in biology from the University of South Carolina.

Rogers has considerable experience in systems acquisition management, particularly with electronic warfare, intelligence, and reconnaissance systems. His last assignment in the Air Force was as the joint program manager of a tri-service (Army, Navy, and Air Force) program to develop a countermeasures dispenser system for use on numerous military aircraft. His plans for the Integrated Effectiveness Branch include continuing to promote the group's excellent reputation as one of the nation's leading centers for modeling and simulation of electronic warfare systems.

He was awarded the National Joint Service Medal in 1989 and the Commander's Award for Merit while serving in the Foreign Technology Division in 1986. He earned the Mervin E. Gross Award for Exceptional Scholarship from the Air Force Institute of Technology in 1973.

Ted Doll transferred to the Electro-Optics Laboratory, effective August 1.

Judy Fitzpatrick was promoted to accountant I and transferred to the MAPS group. She is now working for Richard Odom.

Kathie Coogler Prado has been promoted to technical writer I. Her degree is in journalism, and she occasionally provides editing services for other laboratories to ensure that documents meet military format and English grammar standards.

Andrew S. Slack began work for the Test Process Development Branch July 16 as an RE I.

Brent Darley began work as a co-op for the Sensor Performance Branch and the Test Process Development Branch in June.

Countermeasures Development Lab
Suzy Calvert has transferred to OOD and is now working for David Clifton.

Economic Development Lab
Art Brown is transitioning to the Columbus Regional Office, scheduled to join it full time in October.

Chris Downing, formerly with EDL's Energy Resources Branch, has transferred to ESTL's Environmental Monitoring Research Branch, where he will work on indoor air quality studies and projects.

Electro-Optics Lab
Arvilla Jennings has been promoted to word processing specialist.

Engineering Sciences Lab
Dorothy Baskin was promoted to word processor operator in July.

Radar & Instrumentation Development Lab
Annette Weinberger has been promoted to administrative secretary.

RIDL welcomes **Debbie Powers**, clerk I. The Experimental Branch has gained **Lacey F. Moore**, RE II, and **Hans Troemel**, co-op.

Lucien C. Bomar has been appointed head of the Systems Branch, and **Don J. Strausberger** is a new RE II.

Radar Systems Applications Lab
Marysue Hunt has joined RSAL as a clerk I. ❏

Biographer seeks stories

Georgia Tech English Professor Edith Blicksilver is seeking human interest stories and anecdotes for a biography she is writing about Tech basketball player Dennis Scott, who is joining an NBA professional team. Send material to Professor Blicksilver at the Department of Literature, Communication and Culture, Mail Code 0165. ❏

Personal Notes

Congratulations to Barbara and **Richard Moser** (MATDL) on the birth of a daughter, Helen Rae, August 6.

Fonda Head (Huntsville) has a new baby boy, Christopher Ian, born June 3.

In RIDL, Sharon and **Rob Pauley** welcomed a son, Marshall Gray, July 2, and Mary and **John Trostel** welcomed a daughter, Tara Alice, July 20. ❏

Child Care Fair scheduled again

The President's Child Care Development Center Committee is sponsoring another Child Care Fair on Monday, September 24. The fair will be held from 10 a.m. to 3 p.m. in Room 5 of the Paul Weber Building (Space Sciences and Technology Building). More than 100 nearby day care centers and child development centers have been invited to exhibit, along with organizations sponsoring family day care providers. All members of the Tech community are welcome to come and gather information about child care options.

Further information can be obtained from Margaret Horst, GTRI, 894-3578, or from the Office of Graduate Studies (Phyllis Ray), 894-3090. ❏

No, this isn't a pumpkin—it's the 3.22-pound tomato Dan Campbell and his wife, Candice McCloskey, grew in their garden this summer. They are both research scientists II in the Physical Sciences Lab. Dan works full time, and Candice is an assistant professor of chemistry at Agnes Scott College, with adjunct status at GTRI. The giant tomato, which weighed 1460 grams on the lab scale, was a Burpee Supersteak hybrid fertilized with elephant manure shoveled by the scientific gardeners during Ringling Brothers' last visit to Atlanta. (Photo by Joe Schwartz)