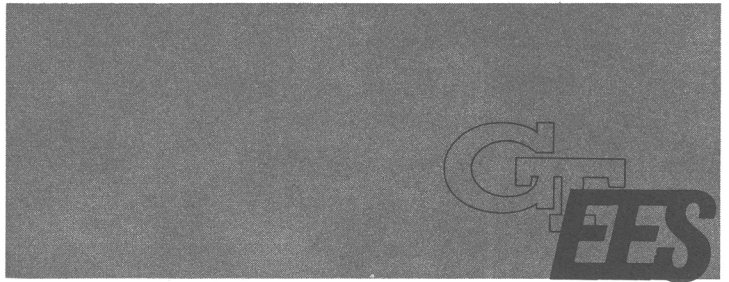


STATION NEWS

ENGINEERING EXPERIMENT STATION • GEORGIA TECH



VOLUME 7 NUMBER 10

NOVEMBER, 1978

Study Pest Insect Behavior Using Radar

Georgia Tech Researchers Study Pest Insect Behavior by Using Radar

As more and more pesticides are banned by EPA, and as the boll weevil, cabbage looper and locust continue to infest major U.S. agriculture crops, more effective means for controlling these pest insects must be found. Georgia Tech's Engineering Experiment Station is currently assisting the U.S. Department of Agriculture in determining some of the problems in using radar to locate insect swarms and possibly identify them as they spread.

"This is a first step in the investigation that may one day lead to the reduction of the environmental impact of pesticides," according to Tech Project Director **Gene Greneker**. "We're in the early stages of investigating how tracking insects swarms by radar may result in a long-term payoff for society. The benefit could be high not only in more efficient use of pesticides but also in technology transfer to other agricultural problem areas as well."

If the radar system concept is feasible, insects could be located in highly concentrated swarms while they are in flight. The spraying of the airborne swarms could reduce the amount of normally necessary pesticides and increase the efficiency. Radar also is valuable, according to the Georgia Tech radar team, in detecting nocturnal habits of insects and the speed with which the infestations are spreading. Greneker adds, "Before advanced insect control techniques can be used successfully, in-

sects' dispersal behavior must be known since this behavior often results in new infestations and expanded populations which must, in turn, be compensated for by pest management programs."

Georgia Tech researcher **Gene Martin** recently completed experiments in Lake Havasu City, Arizona. These tests were intended to determine what advantages could be realized by using millimeter wave radars for detection of insects. Martin comments, "Even though our research is still in the basic stages, it is a necessary step to determine true feasibility of the radar detection techniques that may be perfected over the next decade."

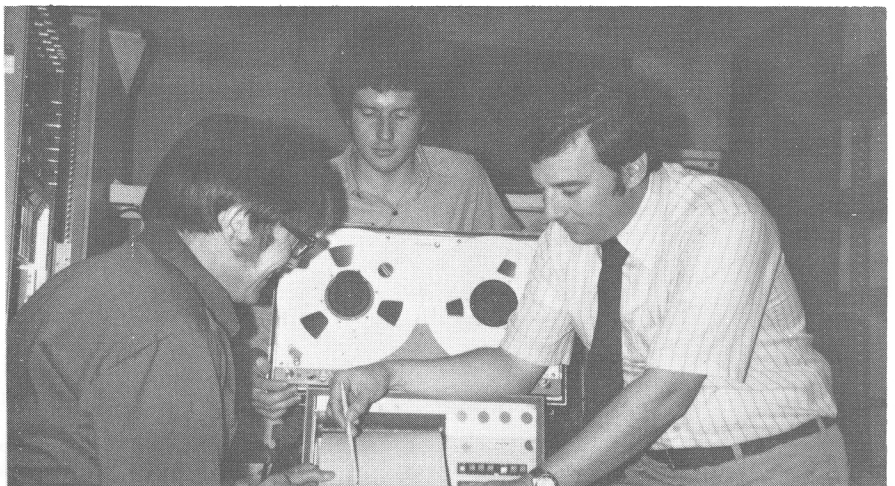
The current Georgia Tech program is funded through the U.S. Department of Agriculture's Southwestern Cotton Research Laboratory, Phoenix, Arizona.

Story on Pest Behavior Research Attracts Interest

The following known publicity for EES resulted from a press release based upon the above sent to the media on October 17:

The Associated Press (AP) ran the story over its wire services which gave nationwide exposure. Gene Greneker (RAIL) informed the Publications and Information Office that WGST taped an interview with him on the following Saturday afternoon; WSB carried the story on Sunday morning, and Greneker heard that the project was mentioned on a local TV station Saturday evening. The *Atlanta Journal* printed the story that Monday, the 23rd. Station KOME in San Jose taped an interview with Greneker as did the U.S. Dept. of Agriculture's radio-tv feed service, The *Valdosta*
Continued next page

Gene Martin, Mark Corbin and project director Gene Greneker examine insect measurement data taken recently at Lake Havasu City, Arizona.



Daily Times used the story on its front page, and a friend noticed the article in the *Moultrie Observer* (Georgia). Greneker talked with the project sponsor in Arizona and was told that a distant relative had seen the story in yet another California paper. Furthermore, Greneker received an interesting call from a pilot who had flown with the British scientist who has also done work in the field in Africa's Sudan — the pilot had read about the EES project in a Ft. Lauderdale paper. "This morning," Greneker reported on Nov. 1, "I received another call on the story . . . this time from a man who had sold radars to the British team . . . it was a sales pitch . . . a different pace from the other contacts."

News from TDL

George H. Lee has replaced **Bill Craig** as head of the Macon Area Office. Prior to joining the Experiment Station, George worked at the Albany Area Vocational-Technical School.

Larry Youngner will begin working at the Augusta Area office on November 15. He was formerly a businessman in Brunswick, Ga.

Eileen Buchner, secretary in the Savannah Area Office, is leaving and **Helen Blum**, secretary in Basic Data, will be taking her position. We are sorry to see Eileen leave EES and Helen leave the C&S Tower.

Chuck Ray of CMSD is now **Dr. Charles Ray**. Chuck was recently awarded his Ph.D. in Chemistry from the Illinois Institute of Technology. He has worked in **Dan O'Neil's** Division since May and is principal investigator for two coatings research studies.

Lee Burks gave a presentation on the Human Operator Control Strategy Model to leaders in the field of control theory at a recent review of Air Force-sponsored basic research individual processes and human operator control in Dayton, Ohio. The event was sponsored by the Air Force Office of Scientific Research.

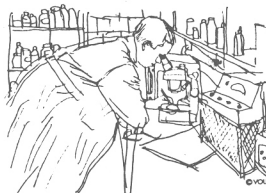
Dan Mazzeo of the Energy and Engineering Div. presented the results of the Energy Conservation Study of the Plating and Surface Finishing Industry to a regional meeting of the American Electroplaters So-

ciety in Cincinnati, Ohio, on October 23.

Dave Clifton, head of the Economic Development Div., has accepted an invitation to serve on the Georgia Rural Development Committee. Operated under the direct charge of the U.S. Secretary of Agriculture, the RDC includes several state and federal agencies and is helpful to these agencies as well as to rural leaders and communities.

Bruce Eelman will begin work in November for the Economic Development Div. under Dave Clifton. **William Spain** has accepted a position on the OSHA State Consultation Program, which is headed by **Bill Howard** of EDD.

Peggy Bronn, **John Giles** and **Randy Mattison** were in Moultrie, Ga., October 10, 11 and 12 to manage Georgia Tech's exhibit on Energy Research for Agriculture at the first annual Sunbelt Agricultural Exposition. More than 100,000 people from the Southeast attended the event.



Tech Awarded Contract to Provide Safety and Health Consultations in Georgia

The U.S. Department of Labor has awarded EES a million-dollar contract to partially fund a program for on-site occupational safety and health consultation services to Georgia business and industry.

Georgia Tech will provide, upon request, assistance to Georgia employers in (1) understanding the requirements of applicable state and federal occupational safety and health laws and implementing regulations; (2) identifying safety and health hazards in their workplaces; and (3) eliminating or controlling these hazards successfully.

This program is conducted separately and independently of any state or federal Occupational Safety and Health Administration (OSHA) compliance and enforcement activity, according to Georgia Tech project director **Bill Howard** of TDL.

EES Services:

The Services Groups celebrated a wedding during the month of October. On Wednesday, the 18th, members of Reports & Procedures, EES Accounting Office, and Supply Services gave a shower for the former **Ms. Deborah Ariail**. Deborah was married on the 21st to Mr. Scott Parmenter of Cartersville. The service was held at Columbia Drive Baptist Church. After the service, the newlyweds took off for two weeks on Hilton Head Island. Mrs. Parmenter will return to work on the 2nd of November.

The Services Groups welcome two new people: **Jim Barnett** joins the Reports & Procedures Department as a messenger, and **Judith Stevens** is working in Supply Services as a Clerk I.

OOD

IEEE Antennas and Propagation Society includes an international membership of 4,500 members, and OOD's **Dick Johnson** was recently elected vice president for 1979.

An Equal Education and Employment Opportunity Institution

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Applied Sciences Lab

Dale Covington attended the 7th International Symposium on GaAs and Related Compounds at St. Louis, Missouri, on September 24-27 for the presentation of a paper, "Photoluminescence and Electrical Characterization of MBE GaAs Epilayers," which was jointly authored with scientists at AFAL, Wright Patterson AFB.

Billy Livesay authored an article entitled "The Reliability of Electronic Devices in Storage Environments" in the October issue of *Solid State Technology*.

In late September and early October **Jack Spurlock**, associate director of ASL, and **Henderson Ward**, professor in the School of Chemical Engineering, were in England and Scotland in connection with EES project, "Systems-Integration Requirements for the Synergistic Co-Siting of Industrial Activities." Their purpose was to discuss with researchers in these two countries the closely related work on integral plant design (research focusing on advanced design concepts for chemical plants, and industrial complexes involving systematized integration and optimization of these systems.) In addition, a basis was established for continued cooperation among the research teams. Drs. Ward and Spurlock have been invited to present a paper on their "Synergistic Co-Siting" research at the "Design 79" conference in September of 1979, to be held at the University of Aston in Birmingham, England.

On Oct. 27, the Overview Committee on the EES project entitled "Systems-Integration Requirements for the Synergistic Co-Siting of Industrial Activities" had its second meeting in the Baker Building. This project is sponsored by NSF. Project team members present at the meeting were co-principal investigators **Jack Spurlock**, EES, and **Henderson Ward**, Ch.E.; **Jude Sommerfeld**, Ch.E.; **Dalip Sondhi**, EES, and others from government and industry.

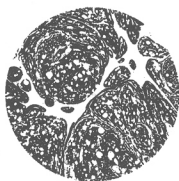
The purpose of the Committee is to offer feedback to the project team as they develop the concepts and methodologies applicable to the design of co-sited industrial complexes so that the feedstocks, energy,

wastes, by-products and land may be used to the greatest advantage.

This summer **R. A. Young** (ASL) gave an invited lecture in Warsaw at the 11th International Congress of Crystallography and in Krakow (Poland) at the Conference on Diffraction Profile Analysis and Open Meeting of the Commission on Neutron Diffraction. He participated in three days of meetings of the International Union of Crystallography Commission on Journals as co-chairman, in the Commission on Nomenclature meeting and as a session chairman. He also served as a U.S. delegate to the 11th General Assembly of the International Union of Crystallography in Warsaw.

Following the activities in Poland, Young visited laboratories at the Universite de Paul Sabatier in Toulouse, France.

Young was recently elected chairman, for three years, of the USA National Committee for Crystallography.



In the past few months the Molecular Sciences Group has received two new contracts from: DOE, **F. P. Tully** and **A. R. Ravishankara**; DOT/FAA, **A. R. Ravishankara** and **P. H. Wine** and one grant from NSF, **A. R. Ravishankara** and **P. H. Wine**.

Frank Tully and **A. R. Ravishankara** attended the DOE Contractors' Meeting in Livermore, Calif., during October. **A. R. Ravishankara** also attended the NSF Tropospheric Chemistry Workshop in Boulder, Colorado, where the needs for tropospheric chemistry research were discussed. **Fred Eisele**, from the Physics Department, has started working part-time with the MS Group.

SEMTD has a new secretary as of October 30: **Sandy Bradley**. Sandy, former financial secretary at a Marietta church, has many interests, including music, and especially piano.

Electronics Technology Lab

During October:

Ron Wallace and **Neil Hilsen** presented a paper at the IEEE Conference on Communication and Power which was held in Montreal, Quebec.

Doug Robertson was recently elected to the Administrative Committee of the Electromagnetic Compatibility Society of the Institute of Electrical and Electronics Engineers.

Don and **Bill Free** were in St. Louis to attend the Electromagnetic Susceptibility Seminar and Workshop.

Richard Moss was in Washington to present results of a recent study of FCC mobile spectrum monitoring. Detailed recommendations were made for future equipment needs, particularly in the area of automated enforcement data acquisition.

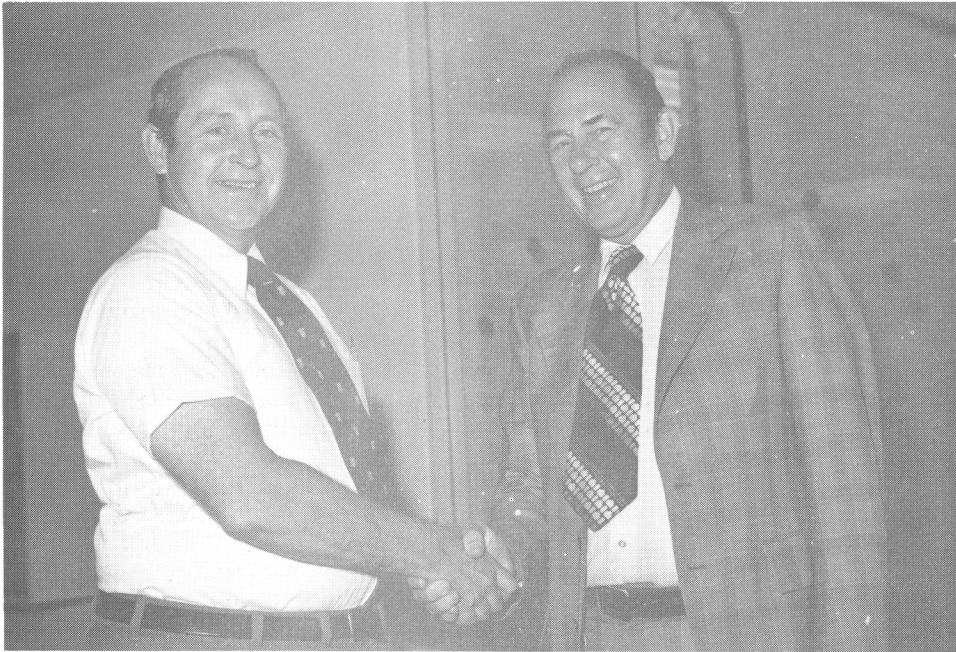


Nancy Westerman

Nancy Westerman has joined the OOD staff as Howard Dean's administrative secretary. Nancy formerly was a secretary with an electronics firm in California, and she has recently moved from Mountain View, Ca., to Tucker. Camping, skiing, sewing and travel are her main interests.

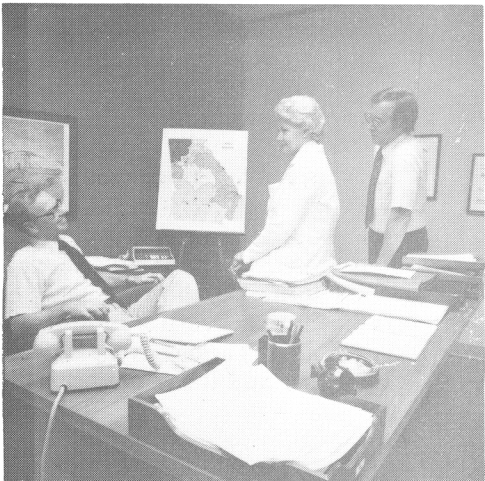


Snap Shots



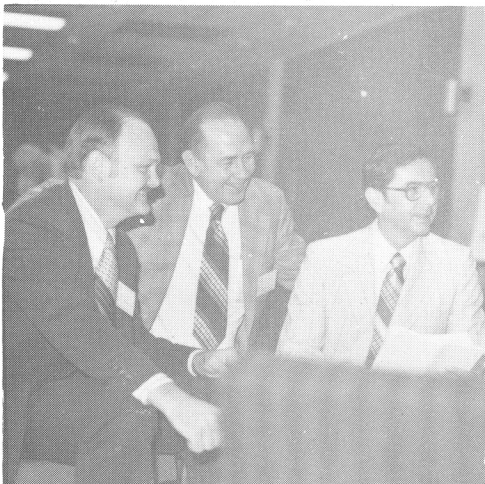
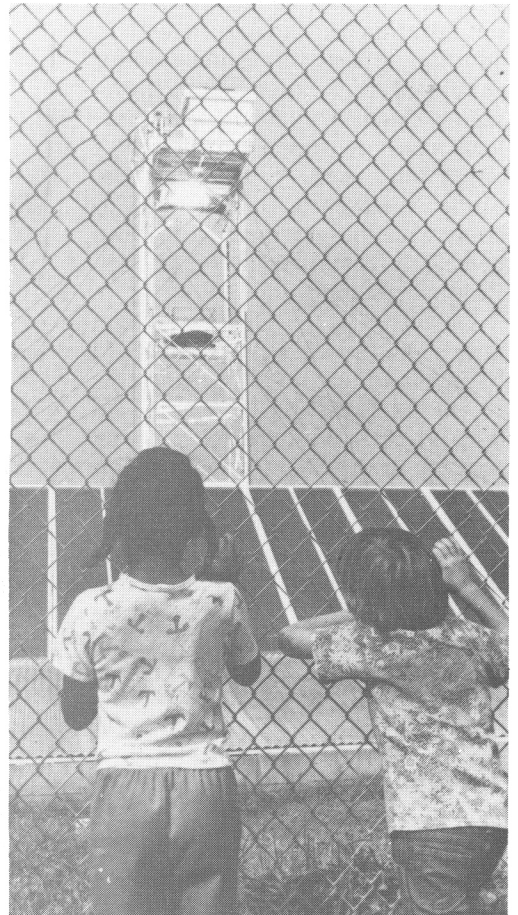
*EES STAFF
 CHRISTMAS
 PARTIES
 3-5 PM
 Fri. Dec. 22
 Cobb County Fac.
 C&S Bank Tower
 Ya'll Come!!*

Visiting at the Cobb County Reserach Facility are Sam Alford, XM program manager, and Don Grace, EES director.



Rudy Yobs, director of TDL, Joyce Culpepper and Ben James (IED) discuss the opening of the 8th Area Office in Gainesville scheduled for the end of the year.

Watching and waiting at the DOE/Advanced Components Test Facility



Jerry Eaves (RAIL), Don Grace and Jim Wiltse (OOD) note the good turnout for the Radar Short Course held in October.

IPO News

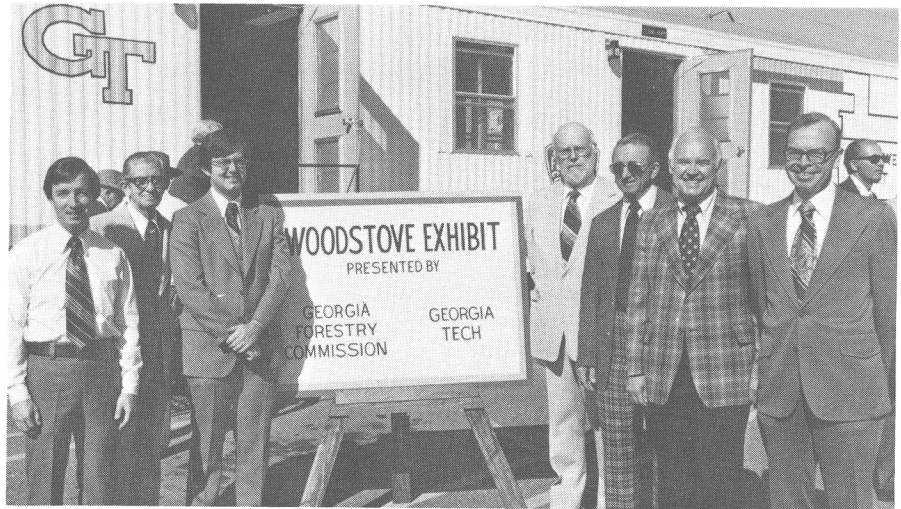
One of IPO's functions is to design, coordinate and implement short-term, tailor-made training programs for visitors from developing countries. **Dick Johnston**, who is in charge of this activity, executed three such programs in October. A three-week program was presented October 1-21 to two industrial extension workers from Georgia Tech's counterpart institutions in Ghana and the Philippines, including observation of the technical assistance activities of the EES area offices. Seven officials from new educational institutions in least-developed areas of Portugal and governmental agencies were here October 30-31 for orientation on Tech's small industries development program, with the Rome Area Office hosting them on a tour of industries. IPO also has made arrangements for Mr. Abdul-Karim S. Zantah, Head, Mechanical Engineering Department of the General Organization for Textile Industry of Syria, to audit a full schedule of fall-quarter academic courses, mostly in ISyE, and to spend the three winter months in making plant visits to manufacturers of textile machinery and parts in Georgia, North Carolina and South Carolina.

Andy Karp has returned to the Dominican Republic for the months of November and December to work on the pump project there.

Welcome to **June Wilson**, new senior secretary for Nelson Wall.

Ross and Faye Hammond have had a street named for them in the Garden Lakes development at Rome, where he headed up Georgia Tech's first field office 16 years ago.

Ross will present two papers — "Systematic Approaches to Appropriate Technology" and "Observations on Small Industry Development Issues" — at the UNIDO Forum on Appropriate Industrial Technology, New Delhi, India, November 20-25, where he will be one of four persons from developed countries invited to participate in a Working Group on Light Engineering and Rural Workshops. Hammond will also spend three days in Manila on the UNIDO project and three days in Seoul on the Korea Credit Guarantee Fund project, returning to Atlanta December 3.



Rudy Yobs (far right) of TDL is joined by Ray Shirley of the Georgia Forestry Commission, Felton Denney also of the Forestry Commission, Robert Ware of the Georgia Forestry Association, Representative Gerald Johnson, State Sen. J.E. Duncan, and Representative Charles Thomas, at the kickoff of the year-long Tech-Forestry Commission woodstove-woodfurnace exhibition. The event took place in Carrollton, Ga., on October 5.

SED News

Would you be prepared to aid in case of a medical emergency? The staff members at Tech's Research Facility at Cobb County were faced with just such a challenge on September 22 when **Bob Zimmer**, Chief of the Systems Engineering Division, became ill.

Several employees efficiently assisted Bob as the receptionist called Security Policeman Al O'Rear, a Red Cross Safety Program instructor. An ambulance, guided into the complex by Cpl. John B. Wix, arrived within minutes.

Assessing the swiftness and capability with which the situation was handled, the staff felt that the value of preparedness was demonstrated. In fact, a cardiopulmonary resuscitation course (CPR) had just been completed by employees. Notice of an advanced First Aid course has now been posted and the list of enrollees is growing.

SED welcomes new employees: **Craig Moore**, student assistant; **Thomas Mowery**, student assistant; **Charlene Russell**, co-op, and **James McCartney**, student assistant.

Eugene W. Griffin, Jr., Budget Analyst I, married Sue Nance on September 30 at St. Philips Cathed-

ral. They will honeymoon in Florida.

Congratulations to **Dr. and Mrs. Peter G. Sassone** on the birth of their baby boy — Peter, Jr., of course — September 19th. Dr. Sassone is an Associate Professor of Industrial Management and a Research Economist in Systems Engineering Division.

Congratulations to **Sharon Campbell**, Secretary of Defense Systems Branch, and Wendell Shropshire. They were married on September 22, 1978.

N.B. Hilsen attended the 1978 IEEE Canadian Conference on Communications and Power in Montreal, Canada on Oct. 19 and presented a paper entitled "Millimeter Wave Communication Satellite Concepts," coauthored with Ronald Wallace.

SED wishes **David L. Kelly** well on his new employment. Dave will be leaving SED on October 31 for work in North Carolina with the Research Triangle Institute.

SED welcomes a new employee—**James R. Marks**, an assistant research engineer in the Systems Technology Branch. Marks has a MSCE in Transportation and will be doing research in that area.

The Division is happy to have **Bob Zimmer** back at work and all hope his health continues to improve.

The Things That One Does for Ma Tech

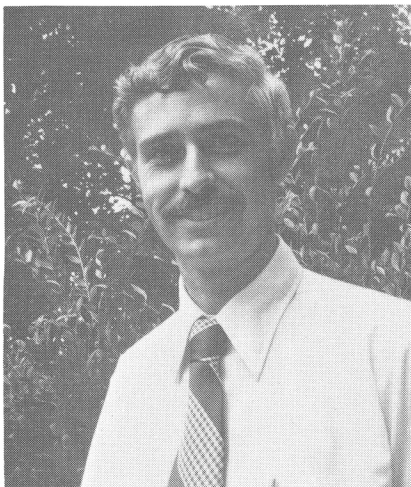
In the world of EES which often involves travel for contract development and program activities, it's not unusual to hear about sojourns to far-off, far-out and around-the-corner places. Owly-birds, jet lag and per diem hysteria are part of the story . . . but sometimes words are not at all adequate in describing what one goes through on the R&D road.

John Goodrum of the Applied Sciences Laboratory, returned from Ghana unwounded. He admits he's not yet unabashed by considerations of "the worst that could have happened," but he is relieved that eight weeks of taking malaria pills are over and that Montezuma's revenge didn't overtake him.

"It was no boondoggle," he laughed as conversation swept through "war stories" about his two-week site visit to a pyrolysis pilot plant located in the heart of south-west Africa. "We even found a live viper on the unit one morning . . . and although Kumasi is a university city of about a million people, the jungles come right up to the campus. One uses deserted paths between buildings, and wearing pith helmets isn't safe because they are too much a negative reminder of colonialism. In fact, many people still associate white men with being missionaries."

Traveling with Goodrum, IPO's Kermit Moh casually remarked en route that the government of Ghana had recently changed hands, and student riots were not unusual. "Even the currency changed while we were there," added Goodrum. "I had a feeling of complete isolation which was based on reality. There's a two to three week wait to make a telephone call because, frankly, the phones never work. It would take a couple days to get a telegram out and even one to two whole days to get good medical attention. It was a racial experience I won't forget either — I would see only one or two white men all day. Perhaps Cokes sustained me. I must have had 30 gallons."

For Goodrum, observable contrasts were of interest. It was a mixture of the old and new . . . in housing, clothing and technology. For example, jets make local flights regularly, yet men will hop off the modern air-



John Goodrum

craft to use jitney horse carts. Cars are not common, and because of inflation and shortages of parts, abandoned cars are part of the terrain.

"And everything is negotiable," Goodrum laughed. "Cabs, for instance, don't have meters so every ride ends with a hassle about how much we would be willing to give. Rides routinely cost \$10.00 for a couple of miles, and as drivers conquer potholed roads, they also honk the horns continually and dodge such obstacles as cows. The buses in Kumasi," continued Goodrum "are really pick-up trucks with artsy paintings and plenty of religious slogans on them. About fifty of us would be packed into one, and if an accident would have ensued, 'good luck to the sardines.'"

For leisure, Kumasi is not Fun City, USA, according to Goodrum. "One could listen to the crickets at night — or chew on sugar cane." People, however, were friendly, and language did not pose a barrier. "We did enjoy visiting a village of weavers known to have made cloth for the kings in years past, and in a village of wood carvers, I watched a worker carve a stool for my family from a magnificent piece of mahogany."

Goodrum admits that before embarking on the Georgia Tech bush country mission, he had visions of rampaging natives and vermine lurking in every bite of food as well as other images conjured up by helpful input from EES would-be humorists. No one mentioned the women of Ghana. The only ones he saw carried on their heads huge baskets of

steamed corn for sale and on their backs, children, not for sale.

"When I first started taking shots for the venture," stated Goodrum, "I felt as though I were just starting school." After two weeks in Ghana — and now immunized for yellow fever, cholera, smallpox and malaria, John Goodrum probably feels as though he has earned a second Ph.D.

RAIL

Jim Metcalf was recently in Silver Spring, Md., for the Conference on Weather Forecasting and Analysis and Aviation Meteorology sponsored by the American Meteorological Society, where he presented a paper entitled "*Southern Airways Flight 242: The Role of Airborne Weather Radar.*"

Jim also visited the NASA Goddard Space Flight Center, where he presented a seminar on meteorological applications of synthetic aperture radar, based on the results of work under his present NASA grant.

Some new people having recently joined RAIL are: **Elaine Acree**, who received her MS from Georgia Tech and is a native of Montgomery, Alabama. **Ralph Brooks**, who received his BS from Auburn. He enjoys electronics and photography. **Ralph** is another one from Alabama. **Pete Britt**, who received his degree from the University of Alabama in Tuscaloosa. **Charles Luke**, who received his degree from Georgia Tech. **Pauline Hampton**, secretary, has replaced **Alice Moore**. Alice is expecting a baby shortly and will continue work on an hourly basis.

