

Station News

Georgia Tech Engineering Experiment Station

Volume 13 Number 4

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TAL Renewable Energy Project Starts In Sudan

The Technology Applications Lab (TAL) has started work on a \$2.6-million, 4 1/2-year project to help the northeast African nation of Sudan adapt and disseminate renewable energy technologies (RETs) to its rural population.

The U.S. Agency for International Development (USAID) is funding the project to assist the Government of Sudan's Energy Research Institute (ERI) in implementing RETs that are appropriate to rural needs and are economically, socially and environmentally sound. The primary focus will be on making more efficient use of wood for fuel and developing energy substitutes for wood, but renewable technologies also will be used to improve living and working conditions. "We have two main jobs," said Project Director Bill Larson; "to introduce RETs to the rural Sudanese and to improve the capabilities of the ERI staff so that they

can select appropriate renewable technologies and introduce them successfully on their own."

Ron Larson (no kin to Bill), previously a Georgia Tech electrical engineering professor and more recently with the Solar Energy Research Institute in Colorado, is returning to Tech to manage the project as the overseas "chief of party." He has an international reputation in the energy and technology assessment field. Assisting Dr. Larson over a three-year period as project energy economist will be Matthew Gamser of Energy/Development International, a Washington, D.C., consulting firm. Gamser has broad experience in assessing wood energy alternatives in developing countries. Another Washington firm, TransCentury Corporation, has subcontracted with Georgia Tech to furnish logistical and training support.

"We'll provide on-the-job training to our Sudanese counterparts," Ron Larson said. "Much of the training will be at U.S. schools and universities, but local and third-country training also will be provided.

"One of our first tasks will be to collect and analyze data on current rural energy use — cooking practices, fuel types and availability, water use and needs, etc. Then we will assist ERI staff in investigating, adapting and field-testing suitable renewable energy technologies. These will include more efficient wood and charcoal stoves, improved charcoal kilns, biomass briquetting, low-temperature solar heating and drying, and production of ethanol from molasses. We also will study water pumping and lifting devices, grain grinding and dehulling technologies, and rural refrigeration techniques. At least six of these tech-

(Continued on page 4)

Dash away to the EES Christmas parties!

Tech Campus Party
O'Keefe Building Cafeteria
Thursday, December 16
3:00 to 5:00 p.m.

Cobb County Party
Building 1 Auditorium
Friday, December 17
3:00 to 5:00 p.m.



Former Director Dies

Director Emeritus of the Engineering Experiment Station Wyatt C. Whitley died November 5 at the age of 82. He was associated with EES from 1955 until his retirement in 1968, first as Chief of the Chemical Sciences Division and for five years as EES head.

The Station experienced rapid growth during Dr. Whitley's directorship. From 1963 to 1968, the level of research activity rose from \$4 million annually to \$7 million, a whopping 75% increase in an era when inflation was nearly negligible, and the number of full-time staff grew by one third. The Electronics Research Building was completed in January 1966, bringing together research activities formerly housed in a dozen temporary locations, and when Dr. Whitley retired in June 1968, construction was well under way on the Baker Building.

Dr. Whitley came to Tech in 1929 after receiving his bachelor's degree in chemistry from Wake Forest College, and earned his master's at Tech while serving as chemistry instructor. He received his doctorate in chemistry from the University of Wisconsin. Rising through the ranks at Tech, Dr. Whitley was named a full professor of chemistry in 1944, a title which he held until his retirement. His colleagues remember him as a man of unflinching good humor with a genuine and strong interest in the future of Georgia Tech and its people.



Water, Water Everywhere

The Technology Applications Lab has a new water pump testing laboratory. International Division personnel, under the leadership of Phil Potts, have been working in numerous developing countries since 1976 to monitor the local manufacture, installation and operation of the AID (Agency for International Development) hand-operated water pump. But it's been only in the last six months that they have branched out into testing the pumps under laboratory conditions. Previously, the AID pumps were sent to England for testing.

Eight pumps manufactured in Ecuador, Haiti, Honduras, the Philippines and Tunisia currently are undergoing testing in the laboratory, which is located in Area 2. They include both shallow-well and deep-well pumps.

"Our principal objective is to evaluate the general quality level of the pumps and to determine their durability and reliability," said B.S. Dixit, director of the testing facility. "A six-month run of 10 million cycles is roughly equivalent to five or six years of actual use in a village. We expect these measurements and studies to

lead us to make recommendations for improving the quality of these pumps and for developing new designs."

The test setup consists of a structural steel framework on which the pumps are mounted and a driving mechanism which includes an electric motor, speed reducer, crank and connecting rod, and a fail-safe device that will shut down the system should the pump fail to pump water. The fail-safe mechanism permits running the equipment 24 hours a day, 7 days a week. For testing deep-well pumps, a head simulation valve is installed.

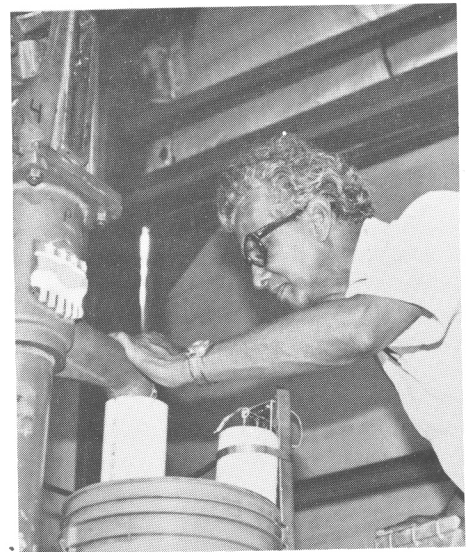
Dr. Dixit supervised the design and installation of the testing procedures and hardware. Much of the fabrication work was done by the machine shop, and Physical Plant assisted with electrical wiring. Helping Dixit monitor the pumps is Graduate Research Assistant Fernando Pareja, a Ph.D. candidate in mechanical engineering.

According to Phil Potts, the pump testing laboratory is only the first step in an expanded emphasis on research and development of a range of water and sanitation hardware in TAL. They are setting up laboratory facilities on

EML Starts Work On Missile Simulator

The Electromagnetics Lab has a new million-dollar contract with the Con-traves Goerz Corporation of Pittsburgh to design and build the computer control and radio frequency portions of a semiactive missile intercept simulator. Joe Newton is project director of the 18-month program, which will be performed in the Millimeter Wave Technology Division under the general supervision of Division Chief John Cotton.

The overall objective of the simulator is to provide the sponsor with an in-house, hardware-in-the-loop capability for demonstrating the R&D feasibility for design, mechanization, advanced development, simulation and comprehensive evaluation of missile hardware. Simulator design activities are directed to the areas of guidance and control, including schemes and components to cover appropriate regions of the electromagnetic spectrum. This capability will improve the sponsor's hardware developments, minimize false program starts, eliminate high-density flight testing, compress development time cycles, and decrease costs.



B.S. Dixit checks the operation of a water pump in TAL's new pump testing laboratory.

the first floor of O'Keefe and hiring additional staff to handle R&D activities under approximately \$1.5 million in new contracts with the WASH Program of AID.

Professional Activities

ECONOMIC DEVELOPMENT LAB

On October 19, **Harris Johnson** was an invited guest speaker at the International City Management Association annual conference held in Louisville, Kentucky. He spoke on the role of small computers and word processors to more than 100 city managers.

Jim Muller was in Limerick, Ireland, the week of November 8, assisting the European Research Institute of Ireland in organizing efforts on its first three industrially sponsored projects.

Ed Bethea was a panelist for the workshop on "Black Business and the Growth Industries of the 80's" at the National Conference on Black Business Enterprise held in Washington, D.C., on November 11-12.

William Spain presented a lecture entitled "Conducting an Occupational Health Program" at a safety and health seminar for small businesses in Atlanta on November 9.

The Safety and Health Division is coordinating a one-week Asbestos Symposium on the Tech campus December 6-10.

ELECTROMAGNETICS LAB

Geoff Holah delivered an invited paper entitled "Far Infrared Filters and Components Using Metallic Mesh" at the recent annual meeting of the Optical Society of America in Tucson.

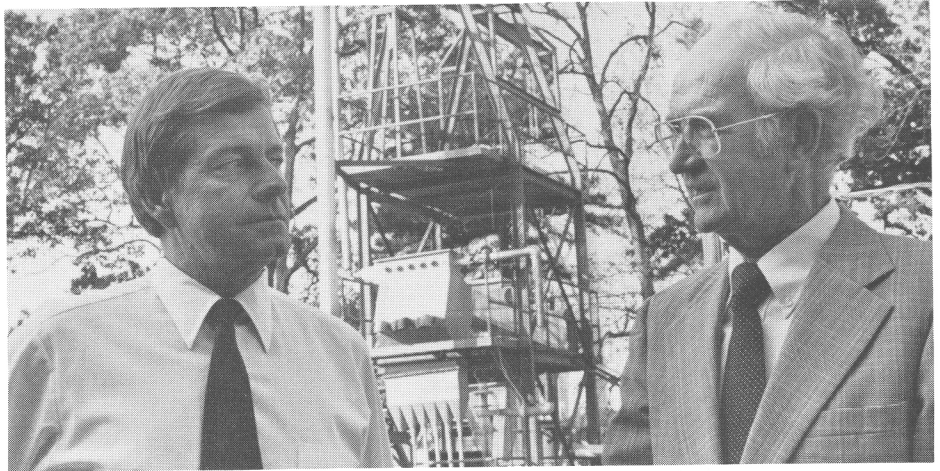
ELECTRONICS & COMPUTER SYSTEMS LAB

On November 17, **Billy Wise** presented a paper entitled "An Interactive Color-Graphics Man-Machine Interface for Energy Monitoring and Control Systems" at the Energy Management and Controls Society annual convention at Salt Lake City.

An article by **Bennett Teates** on "The Role of Decision Support Systems in Command and Control" appeared in the September *SIGNAL*, Journal of the Armed Forces Communications & Electronics Association.

ENERGY & MATERIALS SCIENCES LAB

Hans Spauschus made several presentations in West Germany the week of October 11. He spoke on "Lubricants for Hermetic Systems" at the University of Hannover, made a presentation on "Refrigeration and Air Conditioning Technology Problems



U.S. Senator Mack Mattingly (left) learns about EMSL's work on entrained pyrolysis from Jim Knight. The unit, in the background, is still under construction in Area 2. During his visit on November 10, Sen. Mattingly also saw the solar tower and watched a robotics demonstration. He expressed particular support for research in solar energy and other renewable resources.

and Opportunities in the 1980's" at the CEO Company in West Berlin, and gave a talk on "ASHRAE, An International Engineering Society" in Essen.

Tom Elfe made a presentation to the Utilities Advisory Panel for the Vanguard Project on "Optical and Structural Analysis of the Vanguard Concentrator and Receiver" in Los Angeles on September 15.

Bob Cassanova, Tom Brown and Steve Bomar gave presentations relative to the evaluation of high-temperature materials at the Central Receiver Test Facility in Albuquerque on November 15-17.

OFFICE OF THE DIRECTOR

Jim Wiltse was the speaker at the September meeting of the Central Georgia Subsection of the Institute of Electrical and Electronics Engineers in Warner Robins. On October 26, he spoke in Winder on recent advances in technology and how they will impact our daily lives at a seminar sponsored by the Barrow County Chamber of Commerce and the Advanced Technology Development Center.

RADAR & INSTRUMENTATION LAB

The October *Microwave Journal* contained an article, "Solid State 95 GHz Tracking Radar System," by **Jim Scheer and Pete Britt**.

Papers coauthored by the following RAIL employees were presented at the recent RADAR-82 Conference in London: **Marvin Cohen and Eric Sjoberg**, "Intrapulse Polarization Agile Radar"; **Ed Reedy, Raymond Efurd and M. Yoder** (ONR), "Impact of Extremely High-Speed Logic Technology on Radar Performance"; **Lucien Bomar,**

Bill Steinway, Scott Faulkner and Linda Harkness, "CW Multi-Tone Radar Ranging Using DFT Techniques"; **George Ewell** (STL) and **Stephen Zehner**, "Bistatic Sea Clutter Return Near Grazing Incidence"; **Norberto Ezquerro and Harkness**, "Recognition of Targets by Radar"; **Ekkehart Rausch, Efurd and Mark Corbin**, "A Fiber Optic Pulse Compression Device for High Resolution Radars"; **Frank Williamson and Neal Alexander**, "Low Incidence Angle K_u-Band Clutter Measurements"; **Nick Currie and Zehner**, "MMW Land Clutter Model." **TECHNOLOGY APPLICATIONS LAB**

A paper presented by **B.S. Dixit** and coauthored by **Michael Brown** and **Bill Bulpitt** was published by the Institute of Gas Technology in its symposium volume, *Energy from Biomass and Wastes VI, 1982*; the paper was titled "Case Study of a Commercial Small-Scale Wood-Fueled Steam Boiler for Textile Mill Operations."

Tom McGowan presented a paper on "Heat Pumps and Organic Rankine Cycle Engines" at the Waste Heat Recovery Workshop in Macon on November 10.

Larry Moriarty gave a paper on "Computer Uses in the Poultry Processing Plant" at the 17th National Poultry Health and Condemnation Meeting on October 19 in Ocean City, Maryland.

Jim Clark spent October on the island of Cyprus consulting with the Ministry of Commerce and Industry on utilization of solar energy; the work was sponsored by the United Nations Development Program.

Labs Revamp Units

Two program areas in the Economic Development Lab have been upgraded, due to recent growth. In the Business Development Division, Management and Technical Assistance has been elevated to a branch. The Safety and Health Branch is now a division, and its Industrial Hygiene Group is now a branch. New units under Safety and Health are an Instrumentation and Analytical Group led by **Marilyn Black** and an Advance Programs Office run by **Bill Ewing**. In addition, **Robert Hawkins** has been named assistant to the chief of the Industrial Extension Division.

At the Systems Engineering Lab, dramatic growth in the Concepts Analysis Division has led to abolishing the Systems Analysis Branch and promoting its two groups: **Robert Beasley** heads the new System Effectiveness Branch, and **John Gibbons** heads the Mission Analysis Branch. **George McDougal** has been named associate division chief. Also in this division, the Psychological Systems Group has a new name and status — Human Performance Branch. In the Defense Systems Division, **Ronnie Camp** is the new head, Applied Systems Branch.



EES Hires Recruiter

Patrick J. O'Hare joined EES November 8 as manager of professional and technical recruiting. He brings to the newly created position 11 years of experience in personnel recruiting.

Since 1973, he has been a senior vice president of Stuart Compton Associates, an Atlanta-based regional and national executive search firm. He also spent two years as recruiting manager for an industrial firm, Electronic Data Systems.

"I haven't come to change any normal procedures," O'Hare said. "Personnel Services will continue to handle recruiting of support staff, and laboratories will continue to recruit

their own professional and technical staff. Hopefully, they will consider me an additional resource they can turn to for advice and assistance. I will be available as a coach—to suggest improvements and assist in finding senior people. I also expect to travel a lot."

O'Hare is located temporarily in Room 325, Baker Building, ext. 3662.

Sudan (Continued from page 1)

nologies will be selected for dissemination to the rural population."

Georgia Tech project staff will assist ERI in developing marketing and demonstration techniques to achieve broad acceptance and adoption of these technologies in rural Sudan. They will be installed in several geographical areas to demonstrate their economic, social and environmental soundness. Tech personnel also will help identify possible local manufacturers and give them technical assistance in production.

In conjunction with the Georgia Tech technical assistance project, ERI will administer a separate \$2-million renewable energy development grant from USAID that, among other things, will pay for demonstrations of equipment and hardware to undertake specific manufacturing projects.

Strictly Personal

ELECTROMAGENETICS LAB

Jim Gallagher has been appointed EML chief scientist and will spend half time coordinating program development activities throughout the lab.

Philip Russell is the new son and first child of Becky and **Mike Nicovich**; he was born October 19.

ELECTRONICS & COMPUTER SYSTEMS LAB

The Command and Control Branch welcomes **Lisa Shockey** and **Jacob (Jim) Rhodes**, both research engineers I, and **Joan Bunch**, senior secretary. **Deborah Reid** has been promoted to administrative secretary.

ENERGY & MATERIALS SCIENCES LAB

Hamp Teague has resigned to join forces with Rockwell International in Atlanta. **John Owen** transferred to the Technology Applications Lab October 15. **Rob Roglin**, research engineer II, joined the Solar Energy Division.

RADAR & INSTRUMENTATION LAB

Welcome to **Leslie Brown**, word pro-

cessor operator, and **Mike McGraw**, research scientist I.

SERVICE GROUPS

Accounting: **Joy Lacey** has replaced **George Brock** as accounting clerk.

Instrumentation & Calibration: Welcome to **Thomas Moore**, electronics technician II.

Mechanical Services: Welcome to **James Nowell**, mechanical technician I.

Personnel Services: **Marianne Thompson** is a new personnel assistant I.

Supply Services: **Regina Williams** will marry Gene Swancey on December 18. **Chris Gaddis**, PSD, will sing at the wedding.

SYSTEMS & TECHNIQUES LAB

The Design Services Group has been made a separate unit within STL; **Bill Leverett** is manager.

In the Defense Electronics Division, **W.A. (Skip) Bobst** is a new electronics specialist and **Harrison Williams** a new research technologist I. **Dinal Andresen** has transferred from RAIL.

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