



Atlanta's skyline is shown behind the Tower of Tech's Administration Building.

**ChE** department

## ***CHE AT GEORGIA TECH***

### *A Period of Transition*

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**L**AST WINTER WHILE browsing in the campus bookstore I found a stack of T-shirts imprinted with the message "MIT—THE GEORGIA TECH OF THE NORTH." I returned two days later to purchase one for my friend Professor James Wei (MIT Department Head and a Georgia Tech graduate) only to find they had all been sold. In their place were T-shirts which bore the message "NORTH AVENUE TRADE SCHOOL" (North Avenue is the southern boundary of the campus). I decided not to buy one of the replacement shirts. It probably would not have been received with

much enthusiasm by Professor Wei.

Both T-shirt messages contained elements of truth and fiction. Georgia Tech, like MIT, has a long-standing reputation for quality engineering and scientific education. Unlike MIT, Georgia Tech is a State Institution, being part of the University System of Georgia. Four colleges (Engineering, Architecture, Sciences and Liberal Studies, and Industrial Management) offer undergraduate and graduate degrees in areas that could be described, in a broad sense, by the term "Technology." Degrees are not offered in areas such as music, English, art, history, etc. This last fact is responsible for the "trade school" label on the second stack of T-shirts. Of course, those of us associated with Tech know that this label does not reflect

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reality. Our liberal studies departments are staffed with high-quality faculty who offer a very wide range of courses to help our students obtain a broad education.

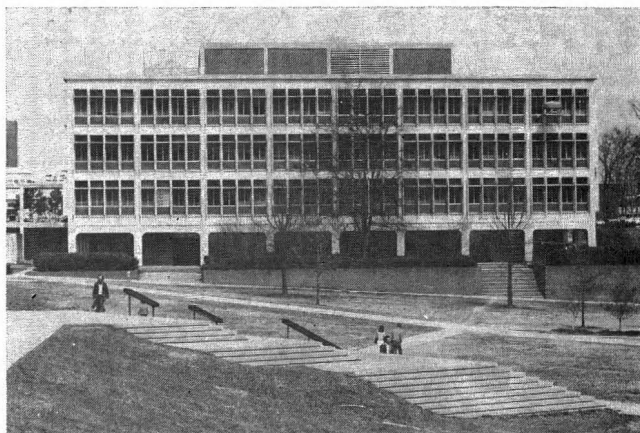
The Georgia Tech campus is located on 280 acres about 1½ miles from the center of Atlanta. With a population of about 1,750,000, Atlanta is the center of commerce in the rapidly growing Southeast. It is a dynamic, beautiful and exciting city with a very diverse population. Atlanta is an educational center with 29 degree-granting colleges, junior colleges, and universities; a center for the arts with a symphony orchestra, a ballet company, numerous art exhibits, local and imported theater groups, a wide variety of special festivals; and a center for sports, with teams in all major professional leagues.

The School of Chemical Engineering at Georgia Tech is comprised of a Chemical Engineering Division, a Metallurgy Division, and the Fracture and Fatigue Research Laboratory, an interdisciplinary research organization. Faculty and other scientific staff are listed in Table 1. The Chemical Engineering Division offers B.S., M.S. and Ph.D. degrees. The Metallurgy Division does not offer a designated undergraduate degree but does have a very active graduate program leading to M.S. and Ph.D. degrees.

The School of Chemical Engineering has been changing rapidly during the past few years. Dr. Waldemar Ziegler retired at the end of the 1977-78 academic year, several faculty have left for other positions and, unfortunately, Dr. Leon Bridger and Dr. Homer Grubb died suddenly during the past academic year. Thus much of our efforts during the past fifteen months have been involved with recruiting new faculty. These efforts have been very successful, with ten outstanding individuals accepting offers to join our faculty. Dr. Edvin Underwood was a Senior Research Scientist here prior to accepting a faculty position. Eight of the remaining nine have moved to Atlanta since April, 1979. Dr. Aryn Teja, presently at Loughborough University, will join us in September, 1980. The faculty members and their areas of interest are identified in Table 1.

## GEORGIA TECH—A BRIEF HISTORY\*

The Georgia Institute of Technology began as the Georgia School of Technology in 1888. The School of Chemical Engineering evolved from the chemistry curriculum. An Engineering<sup>®</sup> Chemistry Program was published in the 1900-1901 catalog. In addition to chemistry and chemical engineering topics, areas such as metallurgy, dyeing, me-



**Chemical Engineering is housed in the Bunger-Henry Building.**

chanics, electricity, minerals, and industrial processes were included in this early program. The 1929 catalog listed a B.S. in Engineering Chemistry, and the 1930 catalog indicated that a B.S. in ChE could be obtained under the Department of Chemistry.

McLaren White, whose father, Alfred H. White, was an MIT graduate and Head of ChE at Michigan, was the first chemical engineer to come to Tech. This happened during the 1920s, and Professor White was part of the chemistry department faculty. Changes toward chemical engineering were too slow to suit Professor White, so he left. The first-prize for the AIChE contest problem is named in honor of McLaren White.

The first Chief of the Chemical Engineering Division within the Department of Chemistry was

\*The information presented here is condensed from a paper, "An Early History of Chemical Engineering at Georgia Tech," by Marcella M. Lusby, Unpublished (November, 1977).

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**The School of Chemical Engineering currently enrolls about 950 undergraduates. This figure includes freshmen who declare a major at Tech and co-op students who are on work assignments. Cooperative education dates back to 1915 at Tech. Today nearly 30% of undergraduate ChE's are in the Coop Program.**

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Dr. Harold Bunger, who started at Tech around 1929. The name of the academic unit was changed to the Department of Chemistry and Chemical Engineering in the 1930s. This department was

headed by Dr. Boggs, with Dr. Bunger continuing as Chief of the ChE Division. Both Boggs and Bunger died in 1941 and the two divisions were split, forming separate departments. Professor

**TABLE 1**

**Staff: ChE Division**

**Pradeep K. Agrawal**; Assistant Professor; Ph.D. 1979, University of Delaware; Heterogeneous Catalysis  
**Charles J. Aloisio**; Lecturer; Ph.D. 1970, Purdue University; Polymer Engineering and Science  
**William R. Ernst**; Associate Professor; Ph.D. 1974, University of Delaware; Heterogeneous Catalysis; Assistant Director for Ch.E. Undergraduate Programs  
**Larry J. Forney**; Associate Professor, Ch.E./C.E.; Ph.D. 1974, Harvard University; Aerosol and Particle Technology  
**George A. Fowles**; Adjunct Professor; Retired Vice President, Marketing, B.F. Goodrich Co.; Plastics Pioneer  
**Charles W. Gorton**; Professor; Ph.D. 1953, Purdue University; Transport Phenomena, Fluidization  
**Edwin M. Hartley**; Associate Professor; Ph.D. 1973, Georgia Tech; Pulp and Paper Engineering  
**H. Clay Lewis**; Professor; Sc.D. 1943, Carnegie Institute of Technology; Chemical Process Design  
**Albert A. Liabastre**; Research Scientist; Ph.D. 1974, Georgia Tech; Surface Science  
**Michael J. Matteson**; Professor; D. Eng. 1967, Technical University Clausthal (Germany); Aerosols, Particle Technology, Air Pollution Control; Assistant Director for Ch.E. Graduate Programs  
**John D. Muzzy**; Professor; Ph.D. 1970, Rensselaer Polytechnic Institute; Polymer Engineering, Energy Conservation, Economics  
**Allan S. Myerson**; Assistant Professor; Ph.D. 1977, University of Virginia; Thermodynamics, Crystallization, Biochemical Reactions  
**Clyde Orr, Jr.**; Regents' Professor; Ph.D. 1953, Georgia Tech; Instrumentation and Particle Technology  
**Gary W. Poehlein**; Professor; Ph.D. 1966, Purdue University; Emulsion Polymerization, Latex Technology; Director of the School  
**Ronnie S. Roberts**; Assistant Professor; Ph.D. 1976, University of Tennessee; Biochemical Engineering, Mass Transfer, Reactor Design  
**Robert J. Samuels**; Professor; Ph.D. 1960, University of Akron; Polymer Science and Engineering  
**A. H. Peter Skelland**; Professor; Ph.D. 1952, University of Birmingham (England); Non-Newtonian Fluids, Mixing and Fluid Dynamics, Heat and Mass Transfer  
**Jude T. Sommerfeld**; Professor; Ph.D. 1963, University of Michigan; Computer Applications  
**D. William Tedder**; Assistant Professor; Ph.D. 1975, University of Wisconsin; Process Synthesis, Optimization and Waste Management  
**Amy S. Teja**; Associate Professor, Ph.D. 1972, Imperial College (London), Phase Equilibria, Thermodynamics  
**Henderson C. Ward**; Professor; Ph.D. 1953, Georgia

Tech; Transport Phenomena, Process Design, Co-Siting

**Mark G. White**; Assistant Professor; Ph.D. 1978, Rice University; Heterogeneous Catalysis  
**Jack Winnick**; Professor; Ph.D. 1963, University of Oklahoma; Thermodynamics, Electrochemical Engineering, Air Pollution Control  
**Ajit P. Yoganathan**; Assistant Professor; Ph.D. 1978, California Institute of Technology; Biomedical Engineering, Polymer Rheology  
**Alex Zhavoronkov**; Visiting Scientist; Ph.D. 1975, Moscow Technical Institute; Aerosols

**Staff: Metallurgy Division**

**Helen E. Grenga**; Professor; Ph.D. 1967, University of Virginia; Catalysis, Corrosion, Extractive Metallurgy  
**Robert F. Hochman**; Professor; Ph.D. 1959, University of Notre Dame; Phys-Chem. of Metals, Corrosion, Biomaterials; Associate Director for Metallurgy  
**John E. Husted**; Professor; Ph.D. 1970, Florida State University; Mineral Engineering  
**Miroslav Marek**; Associate Professor; Ph.D. 1970, Georgia Tech; Corrosion, Dental Materials  
**Pieter Muije**; Associate Professor; Ph.D. 1971, Washington State University; Metallurgy, Mineral Processing  
**Stephen Spooner**; Professor; Sc.D. 1965, Massachusetts Institute of Technology; Physical Metallurgy, Metal Physics

**Staff: Fracture and Fatigue Research Lab.**

**Saghana B. Chakraborty**; Research Scientist; Ph.D. 1974, Georgia Tech; Mechanical Metallurgy, Electron Microscopy  
**Albrecht Gysler**; Visiting Research Scientist; Ph.D. 1965, University of Stuttgart (Germany); Microstructure-Properties Relationships  
**Ludmilla Konopasek**; Research Engineer; M.S. 1975, Manchester University (England); Fracture and Fatigue of Materials  
**Fu-Shiong Lin**; Research Scientist; Ph.D. 1978, Georgia Tech; Corrosion, Fatigue, and Ti and Al Alloys  
**T. H. B. Sanders**; Research Scientist; Ph.D. 1974, Georgia Tech; Aluminum Alloy Development, Microstructure and Fatigue  
**Bhaskar Sarkar**; Postdoctoral Fellow; Ph.D. 1979, Georgia Tech; Stress Corrosion Cracking and Fatigue  
**Edgar A. Starke, Jr.** Professor; Ph.D. 1964, University of Florida; Fracture and Fatigue; Director of the Fracture and Fatigue Research Laboratory  
**Edvin E. Underwood**; Professor; Sc.D. 1954, Massachusetts Institute of Technology; Physical Metallurgy, High Temperature Deformation and Stereology

Jesse Mason became Director of the Chemical Engineering Department; and Dr. Paul Weber, a chemical engineering faculty member, was named Assistant Director of the Engineering Experiment Station.

A reorganization took place in 1948 with Professor Mason becoming Dean of the College of Engineering and Dr. Weber the new Director of the School of Chemical Engineering. Dr. Weber held this position until 1955 when he became Dean of the Faculty (equivalent to the present position of Vice President for Academic Affairs), and Dr. Robert Raudebaugh from the Metallurgy Division was appointed Acting Director of the School of Chemical Engineering for the year. Dr. W. M. Newton assumed the acting director position and



**The "Ramblin Wreck" Parade, a real demonstration of student creativity—weird things that move!**

served for about three years until Dr. Homer Grubb was named Acting Director. The name change from "Department" to "School" was made to identify ChE as a degree-granting component of the Institute; the School of Chemical Engineering offers degrees, the Departments of English, History, etc., do not. In addition, schools are generally more autonomous than departments.

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**One of the reasons for the dramatic, almost three-fold, increase in ChE undergraduate enrollment at Tech during the past five years has been the number of women and minorities entering the School.**

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Dr. Grubb was later named Director of the School, a position he held until 1965 when Dr. Leon Bridger became the Director. During this period the Metallurgy Division developed a significant graduate program which operated partially independently of the Chemical Engineering Division. Dr. Robert Hochman came to Tech in 1959 and is currently the Associate Director responsible for the Metallurgy Division.

Dr. Bridger returned to a full-time faculty position in ChE during the summer of 1978; and Dr. Gary Poehlein was appointed Director after moving to Tech from Lehigh University. The Fracture and Fatigue Research Laboratory, headed by Dr. Edgar Starke, Jr., was also established in 1978.

#### **UNDERGRADUATE PROFILE**

**A**PPROXIMATELY 8500 undergraduates were enrolled at Georgia Tech to start the Fall Quarter, 1979. About one-half of these students are residents of the State of Georgia. The others include representatives from every other state in the U.S. and many foreign countries. A selective admissions policy continues to produce a high-quality undergraduate student body. The 1978 freshman class had an average SAT score of 1161 comprised of an average verbal score of 533 and an average math score of 628. Georgia Tech ranks seventh in the nation in attracting National Merit Scholars and second to Harvard-Radcliffe in the number of National Achievement Scholars enrolled.

The School of Chemical Engineering currently enrolls about 950 undergraduates. This figure includes freshmen who declare a major at Tech and coop students who are on work assignments. Cooperative education dates back to 1915 at Tech. Chemical Engineering became involved later, and Professor Emeritus Waldemar Ziegler was the first ChE Coop graduate receiving his degree in 1932. Today nearly 30 percent of undergraduate ChEs are in the Coop Program.

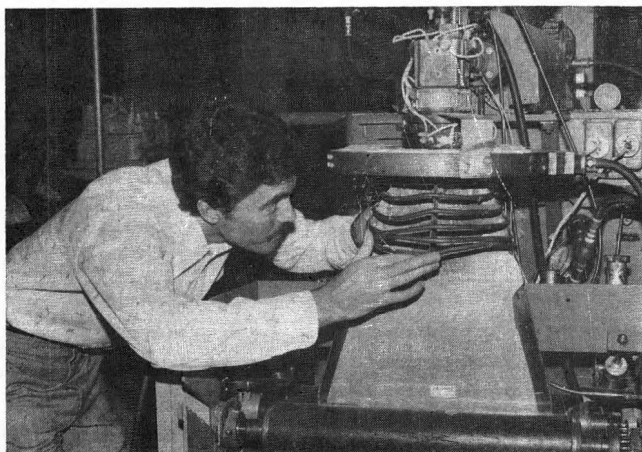
One of the reasons for the dramatic, almost three-fold, increase in undergraduate ChE enroll-

The undergraduate program in chemical engineering is quite rigorous with a good balance between theory and practice. Required courses include two quarters of transport phenomena, three quarters of unit operations, three quarters of design, as well as courses in stoichiometry, reaction kinetics, process control, etc. Engineering drawing and physical education remain as required courses.

ment at Tech during the past five years has been the number of women and minorities entering the School. These numbers have increased from near zero in 1974 to about 30 percent women and 8 percent minorities in 1979. A second significant reason for our increased enrollment has been more participation in dual-degree programs with other universities.

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Students come to Georgia Tech expecting to work hard, and most are willing to make the



Jack Childs checks the assembly of Polymer Fabric Extruder.

necessary commitment to succeed. The vast majority leave Tech with a very high opinion of the Institute and a fond feeling for Atlanta. This loyalty is clearly manifested in the fact that Georgia Tech almost always ranks first among the nation's public institutions in terms of support by alumni and alumnae.

## GRADUATE PROGRAM

THE GRADUATE PROGRAM is in a period of rapid growth. The addition of ten new faculty members should provide us with the manpower necessary to improve an undergraduate program that is already quite good and, at the same time, to build a graduate program of equivalent stature. Enrollment of full-time graduate students in the Fall of 1978 was about 55. These students were about equally divided between the ChE and Metallurgy Divisions. Present graduate enrollment includes 61 chemical engineering students and 40 metallurgy students.

New graduate students entering the School of Chemical Engineering in September, 1979, consisted of 33 U.S. citizens and 9 from other countries. Thirty-six of these students are in the ChE Division and 6 in the Metallurgy Division. A continuation of this sort of success in recruiting graduate students will insure the proper development of our graduate program. We would like to achieve a steady-state graduate enrollment of about 100 ChEs and 40 Mets. with an 80/20 balance between citizens and non-citizens.

## THE FUTURE

THE NUMBER OF NEW faces at our first faculty meeting in September prompted a request for round-the-table introductions. Of course, faculty on our staff last year had an opportunity to meet the new faculty during the campus visits. In fact, a number of significant working relationships have already been developed between new faculty and those continuing to serve on our staff. During a year when more than fifty interviews occurred, however, names and faces can become confused.

This introduction exercise clearly illustrates that the School of Chemical Engineering at Georgia Tech is indeed in "A Period of Rapid Transition." Prediction of the future in such an environment is surely an uncertain endeavor. Our faculty and students are very optimistic. We look forward to an exciting period in the life of an outstanding institution. □