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President's Report to Board of Trustees, 1987-1988

Clemson University

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CONTENTS

Message from President Lennon .......... front flyleaf
Centennial Profile ................................. 2
Agriculture and Food .............................. 5
Engineering and Basic Science ............... 9
Marketing and Management ..................... 13
Quality of Life ..................................... 17
Textiles .............................................. 21
Private Support .................................... 24
Students ............................................. 25
Financial Highlights ............................. 26
Board of Trustees .................................. 27
Executive Officers ............................... back flyleaf
Message from Les McCraw .................... back flyleaf

Clemson University makes real its vision of the future by exploring ideas and taking the lead in inventing new technology in its laboratories and classrooms. Against a backdrop of Clemson fibers being patented, the cover illustrates exciting discoveries in composites materials — a major contribution to the revolution taking place in space travel, transportation, textiles and other industries.
Clemson University is on the move. We are moving into our second 100 years of teaching, research and public service for the people of South Carolina. We are entering our Second Century with a clear vision of how best to focus our resources and efforts for the greatest positive impact on the future. Putting that vision into action is what this document is all about.

This report reflects the creative productivity of Clemson people as we strive to further improve the quality of our teaching, our highest priority as an institution. Our faculty, staff, students and alumni have scored significant successes in each of the five areas of emphasis identified in our blueprint for achieving academic excellence with relevance, our strategic plan called "Clemson University: The Second Century." In this report you will meet just a few of those people and will read about and see a sampling of the major highlights of the progress being made in each of those areas: Agriculture and Food, Engineering and Basic Science, Marketing and Management, Quality of Life, and Textiles.

An example of our overall success is that, for the second consecutive year, research grants and contracts won by the faculty reached a record level. Since 1986, the amount of awards has increased by a phenomenal 86 percent. According to the latest available National Science Foundation rankings, Clemson has moved from 89th to 87th among the nation's top 90 research universities. In addition, Clemson joined M.I.T., Duke, Vanderbilt, the University of California and the University of Illinois in the number of patents issued (four) in 1987.

As 1987-88 drew to a close, there was encouraging news about state funding as well. Clemson will be a leader in the higher education initiative known as the "Cutting Edge," which will provide state colleges and universities additional resources for research, scholarships, faculty development and teaching improvement.

With that exciting background, I am pleased to present to you this report, which focuses not so much on what Clemson has done as on what Clemson is doing to shape a brighter future for those we serve. Come take a glimpse into our Second Century.

Max Lennon

Clemson President Max Lennon stands in front of the new Information Technology Center, dedicated in the spring of 1988 as the lead building in the Clemson Research Park.
If Jerome V. Reel Jr. wanted yet another thing to do, he could easily open a hat shop — with the many hats he wears at Clemson providing the initial inventory. On top of his full-time job as vice provost for undergraduate studies, this scholar of the Middle Ages, father of three, and lover of crayfish and opera is chairman of the University’s Centennial Committee. Though he is quick to credit others for their hard work and cooperation, the success of Clemson’s Centennial celebration is largely due to Jerry Reel’s skillful planning, coordination and leadership. Reel was an obvious choice to chair the Centennial. His field of scholarship, medieval European history, includes the origins of the university movement, and he is unofficially recognized as Clemson’s resident expert on academic pageantry and ceremony. He is a senior faculty member, having joined the University in 1963, and has directed the inaugurations of two Clemson presidents. More than that, though, Jerry Reel personifies the threefold mission of the land-grant university: teaching, research and service. His teaching excellence has earned him the Alumni Master Teacher Award from his students. He is an active researcher who travels to England regularly to further his work. His service activities are legion, ranging from reviewing books for newspapers and educational radio to chairing committees of the S.C. Association for Continuing Higher Education. He is a man with traditional values — commitment to family, education and church — who has an enlightened vision for Clemson’s future: “A university is both a custodian of culture and an agent of change,” he says. “The lesson of history is that change is constant. We must work to shape that change, not be shaped by it. Clemson must be a front-runner into the future.”
On April 6, 1988, bright orange, white, gold and purple flags snapped smartly in the breeze across South Carolina. The official flags of Clemson University, flying for the first time, opened Clemson's Centennial celebration. They were designed by a Clemson professor and a Clemson artist to symbolize the mission, the method and the reach of South Carolina's land-grant University. The Centennial period began on the 100th anniversary of the death of Thomas Green Clemson, whose will provided for the establishment of Clemson Agricultural College. The observance will continue until November 1989, the 100th anniversary of the state's acceptance of Mr. Clemson's bequest. In all, more than 100 events will mark Clemson's commitment to "Tradition and Vision," the overall theme for the celebration. Centennial activities are occurring in four phases. The spring of 1988 addressed the relationship between the university and the arts. This fall the emphasis is on the land-grant university's role in shaping the future of science and technology. In the spring of 1989, Clemson's impact on South Carolina will be considered, and the whole state will be invited to campus during the first week of April for an open house and replacement of the time capsule in the cornerstone of Tillman Hall, Clemson's first building. In the fall of 1989, the focus will be on the university's responsibilities in the world at large. As this plan suggests, Clemson is using the occasion of its Centennial not so much to celebrate the past as to contemplate the future. Clemson University is determined to make its Second Century even better than its first. In addition to the flag raising, other highlights of the Centennial observance thus far include removal and opening of the time capsule in the cornerstone of Tillman Hall; a keynote address by opera legend Beverly Sills; publication of Tradition and Vision: A History of the Presidency of Clemson University, a collection of biographical essays by Clemson faculty and the first of three Centennial books; and the Centennial meeting of the Board of Trustees, followed by a symposium on university governance sponsored by the Board and the Faculty Senate.
South Carolina Agricultural Experiment Station scientists are field testing a biotechnology tracking system, developed by Monsanto, to determine if genetically engineered microorganisms can be effectively monitored in the environment. Early results of the landmark research at the Edisto Research and Education Center are positive. If that holds true for the entire 18-month project, it will have a major impact on the application of biotechnology, which is projected to be a multibillion-dollar industry by the year 2000. Clemson’s initiatives could help attract much of that to South Carolina.

The Clemson Extension Service has launched a $2.2-million project to revitalize rural S.C. communities. The W.K. Kellogg Foundation is funding half, with resources from Clemson and other agencies accounting for the rest. Citizens in four pilot counties will receive leadership development training and will work to identify and solve local problems. The results will be shared statewide. The project will help position South Carolina to reap maximum benefits from the economic and social opportunities of the 21st century. A four-year plan developed with advice from more than 5,000 citizens is helping the Extension Service focus on the problems considered most pressing by South Carolinians. The plan was announced in August 1987 after a two-year development process during which local-level committees identified 1,803 problems that need attention. These were summarized and ordered by priority, and proposed solutions were reviewed in public meetings across the state. Extension professionals from a variety of disciplines are supervising implementation. A new catfish farm in Hampton County reflects Clemson’s increasing efforts to boost development of South Carolina’s growing aquaculture industry. The farm is a demonstration and training facility for farmers, county agents, and students from Clemson and various technical schools. Costs are being shared by Clemson, other local and state agencies, and private business. The revolutionary Ultrapress system of processing apple juice received one of five national honors presented in October 1987 by Food Processing magazine. The system, developed by the S.C. Agricultural Experiment Station and CARRE Inc. of Seneca, received a patent in December and is being evaluated by various companies for use in processing other fruit juices.
Mary Haque's classroom has no walls — which is probably a good thing since you'd be hard pressed to find a room big enough to contain her enthusiasm for teaching. And though she does bow to the necessity of indoor instruction, "outdoor academics" is her specialty and the cause she champions at Clemson. "My dream is to see Clemson University stand out as an exemplary regional center for environmental education," she says. "I hope one day that we will have all our trees and shrubs labeled with their scientific and common names and that the campus will be filled with comfortable outdoor places where people can eat or study or just meet with each other to talk." The dream is consistent with Haque's position as a professor of horticulture, but her vision of education is much broader than her title might suggest. She advocates a "multidimensional" approach to learning that incorporates scholarship, social awareness, artistic expression, civic participation, athletic ability and spirited exploration. That approach and her belief that "genuine learning is active, not passive," are the impetus for the many interdisciplinary projects she assigns to her students. Among the most recent is the Clemson Centennial Footpath, which combines agriculture, architecture, history and landscape design in a series of three trails winding around and through the campus. She also had her students develop computer-generated designs for the mall and lobby areas of the main agricultural complex on campus. Haque has won many teaching tributes, including the American Society of Horticulture Science's 1988 "Outstanding Undergraduate Educator" award. But she takes even greater pride in the awards won by students like Lori Hassell, who spearheaded the footpath project. Hassell (on the left in the photo with Haque) received regional and national honors for her paper about the project. "The students do all the work," says Haque. "My accomplishments are really their accomplishments."
There's money to be made in the cattle business in South Carolina, says Clemson Extension beef specialist Henry Webster. But to make it requires smart management, above average cattle and a working understanding of the importance of genetics. "There's a constant education effort involved in furthering the beef industry in South Carolina," says Webster, the Clemson Extension Specialist Association's Master Extension Teacher for 1988. "The goal is to develop and put together systems and programs that will improve reproduction efficiency and allow the farmer to withstand problems that come up — like drought." Results of Webster's educational leadership since he joined Clemson in 1979 include a comprehensive, cumulative record-keeping system for tracking the growth and performance of individual animals, a key to quality control for beef producers. Other states have adopted the S.C. system as a model. Also, improved performance standards for bulls have resulted in higher quality animals and better prices for beef farmers. South Carolina has the nation's only breeding soundness program to incorporate maternal traits as a quality control factor. Another innovation, annual replacement heifer sales, helps farmers hold down bull replacement costs and improve the genetic quality of herds. South Carolina was the first state to adopt this marketing procedure now used in North Carolina, Kentucky and Mississippi and under consideration in other states. Webster also provides leadership for The Carolina Cattle Connection, a monthly publication jointly produced by the North and South Carolina Cattlemen's Associations. He volunteers as executive director of the 2,800-member South Carolina group. The S.C. Junior Beef Round Up heifer sale, which this year attracted 128 youths showing 230 heifers, is another major accomplishment. "Coming up with and developing new ideas is what motivates me," says Webster, who places the value of cattle currently in the Palmetto State at more than $180 million. He's eager to develop new ideas that will help the beef industry grow even bigger and better in South Carolina.
Results of the first major research effort of the S.C. Bioengineering Alliance are good news for orthopedic patients and the state. Clemson, the University of South Carolina and the Medical University of South Carolina form the alliance that announced in March 1988 the development of ORTHO-PERT, a revolutionary computer process for making customized joint implants. The project, led by Clemson bioengineer Larry Dooley and funded in part by the S.C. Legislature, could produce significant patent income for the state. A new $2-million “clean room” will permit Clemson electrical and computer engineering students to learn about integrated circuits through hands-on experience and will support bioengineering and materials research. The facility, funded principally by the S.C. Legislature, is equipped with special air filters to produce an atmosphere clean enough for testing defect-free integrated circuits, whose tiny parts can suffer catastrophic damage from particles in ordinary air. The College of Engineering’s new Program for Engineering Enrichment and Retention (PEER) expands Clemson’s efforts to attract and keep Black students. PEER matches each Black freshman engineering major with a Black junior, senior or graduate student “mentor” who gives advice and encouragement throughout the first year. The October 1987 issue of *Engineering Education* magazine ranked Clemson 34th in the nation in the number of baccalaureate engineering degrees awarded to Blacks, 29th in the number awarded to women and 30th in the total number awarded. Clemson successes in research areas of international importance are attracting the interest of academic, business and government leaders around the world. In 1987-88, two groups visited from Japan to discuss both the possibility of establishing in their country a branch campus of a U.S. university under Clemson’s direction and a joint research endeavor in biochemistry. Also, a group from China toured Clemson’s robotics laboratory, and a group from Egypt’s Tanta University came to talk about starting an academic exchange program. Dr. John Kenelly, Alumni Professor of Mathematical Sciences at Clemson, is directing from Washington, D.C., a two-year initiative funded by the National Science Foundation to improve calculus education, a cornerstone in the development of the young scientists who will lead the country into the 21st century. Dr. Kenelly is one of the nation’s leading experts on education reform and educational uses of technology.

Funding from the State Legislature for a $2-million “clean room” advances Clemson’s leadership in research related to integrated circuits, bioengineering and materials.
Stereotypes of teachers rankle Gene Bishop. There's a lot more to teaching, he says, than giving lectures and grading tests. "Some of the most important time I spend is in the hallway talking to students one-on-one," he says. "Sometimes, they'll be sitting on the steps outside the building waiting for me to let them in when I get here early in the morning." It's that sort of care and extra effort that earned Bishop, a professor of mechanical engineering, the 1988 Alumni Master Teacher Award from the Student Alumni Council. It's also why during the spring Clemson's chapter of Pi Tau Sigma, the mechanical engineering scholastic honor society, established in his honor the Eugene H. Bishop Award for Excellence in Teaching. "I've always taught," says Bishop, a former department head and associate dean. "Even when I was an administrator, I maintained contact with the students. That's very important to me, and it's something you don't forget." Doug Hall will never forget Gene Bishop. "Frankly, I owe everything to Dr. Bishop," says Hall, a 1987 graduate now with Fluor Daniel in Greenville. "I was ready to give up. I didn't think I'd ever make an engineer. But Dr. Bishop never gave up on me. He sat me down, told me what I was doing wrong and showed me that I was a good engineer. He gave me the motivation I needed to go on. He definitely was the most sympathetic, understanding and helpful person I came across at Clemson." An active researcher as well as a good teacher, Bishop says the two go hand-in-hand: "You can't stay static in your field — especially in engineering. If you do, you can't prepare your students for what they'll face after graduation." The key is to keep a proper perspective, which he says his mechanical engineering colleagues strive to do every day. "There is a real interest on the part of our faculty in the students who come here," he says. "We want an education at Clemson to be the best you can get anywhere. There are a lot of master teachers in this department."
One of the world's leading fluorine chemists works at Clemson University. He is Darryl DesMarteau, head of the chemistry department and winner of the 1988 Drug Science Foundation Award for Contributions to Science in South Carolina. He is also a 1988 recipient of the West German government's Alexander von Humboldt Prize, a prestigious award given annually to senior U.S. researchers in the natural sciences and engineering. The prize will allow him to travel, all expenses paid, to Germany for several months of research and lectures. DesMarteau is fascinated by the notion of shuffling atoms around. He is an international expert in the process of substituting atoms of fluorine for atoms of something else, such as hydrogen, to enhance certain properties or to create new substances. "Our motivation is to make things that have never been made before," he says, referring to the nine-member research team he directs. "We set out to make simple new molecules and then look at their chemistry." Along the way, his discoveries have created quite a stir within industry as well as in the academic community. In January 1988, for example, he won a patent for a new, highly selective, safer method of fluorinating organic compounds. The process could speed up the development of medical and agricultural products. Among the research projects that currently help fill up his 60-hour workweek is the study of superacids of carbon and nitrogen. He says the work, sponsored by the Department of Energy and the Gas Research Institute, could lead to a new area of chemistry, with applications in fuel cells and novel batteries. He is also keenly interested in the effects that chlorofluorocarbons (CFCs) are having on the earth's ozone layer and has won a grant from the Environmental Protection Agency and the Electric Power Research Institute to develop and study possible replacements for CFCs. "The handwriting is on the wall," he says when discussing the damage being done by CFCs. Darryl DesMarteau has read it and is helping to write the answers.
Management students and researchers at Clemson are exploring practical applications of artificial intelligence in the business world and in business schools in an "expert systems" laboratory sponsored by IBM. The company in the fall of 1987 awarded the management department its largest research package ever: contracts and equipment valued at $705,000. Expert systems involve getting computers to ask questions and make recommendations based on the answers to those questions. Research by management professors Jack Kanet and Steve Davis could lead to computerized decision support systems that help apparel manufacturers more accurately identify, understand and justify the benefits of applying new technology to their businesses. The research, part of the School of Textiles' interdisciplinary Apparel Advanced Manufacturing Technology project, focuses on developing a process to help managers consider factors such as product quality and lead time when making technology decisions. Management faculty continue to develop programs that give students experience in real-world decision-making. Professors Larry LaForge and Chuck McNichols won the Decision Sciences Institute's 1986 Instructional Innovation Award for their course based on a computer-simulated manufacturing plant that focuses on make-to-stock production. That work was supported by an IBM research grant. Now, with support from Hewlett-Packard and Jobscope, Dr. LaForge has developed a complementary program geared to another major industrial environment, make-to-order product manufacturing. The worldwide marketplace is the focus of Clemson's new Language and International Trade Program, which has attracted 177 majors since it began in the fall of 1987. Students in effect major in both a foreign language (French, German or Spanish) and an international business field (global marketing, international agricultural trade, international textile marketing, international tourism, or international forest products marketing). Summer internships abroad are also a part of the program. With support from Greenwood Mills and other companies, management professor Earl Burch is exploring how industries can use statistical analysis to improve product quality and process efficiency and sharpen their competitive edge. Dr. Burch is a veteran researcher in the field of statistical process control, an area that is receiving increasing attention as international competition intensifies.

Luciano Cont, president of Swiss textile machinery manufacturer Sulzer-Rüti Inc. and a member of the advisory council of Clemson's Language and International Trade program, outlines business opportunities around the world with seniors Craig Lippincott and David Penney.
During seven and a half years of cost analysis, supervision and planning for the DuPont Co., Judy Holmes gained considerable firsthand experience in decision-making. She bolstered that industrial-strength experience with a doctoral dissertation on the factors managers emphasize when selecting information systems technology. As a new member of Clemson’s management faculty, she enhances the department’s expertise in the impact and applications of information systems in the business world. Holmes received her doctorate from Clemson in May 1988. She did her undergraduate work in economics and business administration at Vanderbilt and earned her M.B.A. at the University of Tennessee at Knoxville.

“We’re extremely pleased and excited to have Dr. Holmes join our faculty this fall,” says Michael Stahl, management department head. “Her areas of expertise, information systems and competitive strategy, fit directly into our department’s focus within the University’s Second Century plan.” A love of teaching helped Holmes decide to pursue an academic career. While working for DuPont, she began teaching night courses at local colleges. “Before long, I was enjoying my part-time hobby more than my full-time job,” she says. When a job relocation for her husband put her in the Clemson area, she entered the doctoral program. While writing her dissertation, she taught for a year at the University of South Carolina at Spartanburg. At Clemson, she is furthering her research in information systems technology selection and is working on a proposal to develop an “expert system” to help high school students choose which college to attend. Expert systems involve getting computers to ask questions and make recommendations based on the answers to those questions, much like a human expert or consultant would do. Just as expert systems technology can help managers make key business decisions, Holmes says, it also could help students by “showing them what factors are truly important in selecting the right college.”
Cotton and Clemson have been dynamic forces in Mat Self’s family for three generations. “My grandfather was in Clemson’s first class,” says the young president and chief operating officer of Greenwood Mills Inc., “but he had to drop out and go to work when the price of cotton dropped to seven cents a pound.” From that inauspicious beginning nearly 100 years ago, the Self family has become one of the innovative forces in the textile industry and in the leadership of Clemson University. Mat’s father, James C. Self, and brother, James C. Self Jr., both preceded him as company president. His father is a life member of Clemson’s Board of Trustees and chairman of the Greenwood Mills executive committee. James Jr., a 1965 Clemson industrial management graduate, is the company’s board chairman and chief executive officer. William Mathews “Mat” Self, who earned his Clemson degree in industrial management in 1971, is a member of the College of Commerce and Industry’s Advisory Board. The College of Commerce and Industry includes both the Department of Management and the School of Textiles, a combination that well suits Self’s interests and style as a progressive business leader and company president. “We’re interested in developing more partnerships with our customers,” he says. “Our goal is to provide the customer a high-quality piece of fabric at a fair price.” Under his leadership, Greenwood Mills has supported research in Clemson programs ranging from the College of Agricultural Sciences to the College of Engineering. Currently the company is active in the development of the Clemson University Textile Research Center and is a sponsor of research in the management department on how industries can use statistical analysis to improve product quality and process efficiency. “Clemson is a big resource for business and industry in this area,” he says. “We look forward to the growing opportunities for involvement with the University.”
Clemson is the headquarters for a major education initiative announced in November 1987 by Gov. Carroll Campbell. Project REACH — the Rural Education Alliance for Collaborative Humanities — unites 11 institutions of higher education and 10 public school districts in an effort to improve literacy levels through study of the humanities. The project is funded by a $175,000 grant from the Rockefeller Foundation and allocations from the Governor’s Office and the S.C. Committee for the Humanities. Led by Dean Jim Barker, Clemson’s College of Architecture is making major strides to expand and improve its already outstanding program. In January 1988 the college opened a residential center on the campus of the College of Charleston, giving Clemson students the opportunity for extended, on-site study of the port city’s rich architectural history. During the fall of 1987, another historic city turned to Clemson architecture students for help. Clemson is the only school in the country whose students were asked to submit proposals for the redesign of Philadelphia’s waterfront. Graduate education is becoming increasingly accessible to South Carolinians through Clemson’s Telecampus program, begun in January 1988. Courses in a variety of disciplines, ranging from nursing to building science, are broadcast through a service of the S.C. Educational Television Network to viewing sites across the state. Four remote sites (in Florence, Greenville, Greenwood and Rock Hill) were available during the spring semester. Two more (Charleston and Aiken) were added for the fall of 1988. Clemson’s College of Nursing offers the only school nurse practitioner certificate program in the Southeast. The program, which combines academic and continuing education credit, received the S.C. Association of Higher Education’s “Most Innovative Program Award” for 1987. The National Dropout Prevention Center at Clemson is moving full speed ahead with its efforts to cut the high school dropout rate. In its first two years, the center has established the S.C. Dropout Prevention Network and published a national directory of dropout prevention programs. The beginning of the 1988-89 fiscal year in July brought both a permanent director, Dr. Jay Smink, and a $500,000 appropriation from the state.

Clemson researchers Holley Ulbrich and Richard White and S.C. Water Resources Commission Executive Director Freddie Vang (center) spearhead a team effort of the Strom Thurmond Institute to help the state plan now for the future use and management of our precious water resources.
Tony Evans' first role in the theatre was as a tree stump. He's branched out considerably since then. In just two years on the Clemson faculty he has become a star performer in a wide variety of academic and volunteer activities, from teaching drama and public speaking to developing and leading special programs for area school children. "Teaching is my primary focus," says this performing arts department faculty member. "One of the most important people in my life was a teacher who was willing to stay late with me. I figure the best way I can reciprocate for the things that people like that have done for me is to do the same. If one more kid gets that same idea, that's worth all the effort." Among the many groups that benefit from Evans' talents and energy are the Clemson Players student theatre troupe, for whom he has directed several productions; the Clemson Area Youth Theatre, on whose board of directors he serves; and the Clemson University Black Faculty and Staff Association, which he is helping to organize. He's also a key player in efforts to recruit and retain more Black students. He teaches in the Clemson Career Workshop, which brings Black high school students to campus each summer for a taste of college life and course work, and he helped plan and direct a public dinner held in September 1988 to launch a $1-million fund drive for Black scholarships. Atlanta Mayor Andrew Young was guest speaker for the event, sponsored by the Clemson Black Alumni Council and marking the 25th anniversary of the enrollment of Clemson's first Black student, former Charlotte Mayor Harvey Gantt, for whom the scholarship fund is named. When he's not teaching or volunteering, Evans works as a professional actor. Recent credits include an educational video about math called "You Can Count on It" and an episode of the "America's Most Wanted" television series. In a dozen real-life roles, Tony Evans is one of Clemson's most wanted. You can count on that ... and him.
Above the joyful noise of the splasher in the pool, cheers of “Hey, Charlie, watch this!” greeted the tall, lanky friend who approached. On the other side of camp, the cheers were the same. Only this time, the greeters were teetering, securely fastened to safety lines, on a tightrope strung high between two trees. The splasher were enjoying the newest facility at Clemson’s Outdoor Laboratory, a $152,000 swimming pool designed for the handicapped and given to the University by the Sertoma Clubs of South Carolina. The tightrope walkers besides having a fantastic time were learning that the limits on one’s ability begin only at the end of one’s determination to succeed. Charlie White watched all the activity with professional pride and personal satisfaction. As director of the Outdoor Lab, he supervises the Department of Parks, Recreation and Tourism Management’s residential camping programs for special South Carolinians. The facility serves more than 1,000 physically and mentally handicapped, underprivileged and elderly campers each summer. During the rest of the year, the complex accommodates conferences, workshops and retreats, bringing the total number of annual users to more than 12,000. “Serving people is my professional high,” says White, whose roles vary from counseling homesick campers to directing the internships of college students working in the summer camps for academic credit. User fees make the programs and services of the Outdoor Lab largely self-supporting. Civic groups, such as the Sertomas, Jaycees and Lions Clubs, and other state agencies sponsor the summer camps. A fund-raising effort to build by 1990 a $500,000 endowment for the Outdoor Lab has attracted more than $250,000 in gifts and pledges, including a $100,000 commitment from the Knights of Columbus and $125,000 from the S.C. Jaycees. “There were several roads I could have taken,” says White, reflecting on his decision to come to Clemson, sight unseen, 18 years ago. “I took the right one.” Hey, Charlie, we agree.
With equipment installed and veteran manufacturing supervisor Edward Hill on board as site manager, Clemson’s new Apparel Advanced Manufacturing Technology Demonstration Center is entering its operational phase. The facility is the centerpiece of a $3.5-million, 3-year research project, co-directed by textiles professor Christine Jarvis and computer science professor Jack Peck. The project is funded by the U.S. Army’s Defense Logistics Agency to study state-of-the-art manufacturing technology and equipment. The research agreement, the largest in Clemson’s history, could be extended up to 10 years, with a total potential value of $10 million. A new dimension in industry-university cooperation is emerging with the development of CUTREC, the Clemson University Textile Research Center. A prospectus for putting the center into operation was presented to the National Science Foundation this fall. An industry can benefit from the center’s research by agreeing to make an annual unrestricted grant of $30,000. Aggressive recruiting that emphasizes the many career opportunities in the field is helping to attract a growing number of students to Clemson’s textiles programs. The School of Textiles received 120 applications from incoming students for the fall of 1988, yielding the highest number of new textiles majors in 30 years. The school’s student recruiter since 1987, Gladys Conte, works to increase interest in and improve the image of textiles as a career choice. Textiles professor Clarence Rogers continues to expand Clemson’s High Volume Instrument Testing Laboratory. His advanced research into the properties of cotton fibers is important not only in textiles, but also in agriculture. Meanwhile textiles professor Mike Drews’ work with colleagues from the College of Engineering on advanced engineering fibers and composite materials has tremendous implications for the future of textile, chemical and ceramics industries. Participants from England, Japan, Thailand and India attended the 1987-88 session of Clemson’s annual Nonwoven Fabrics Forum, marking the first time in its 19-year history that the event has reached beyond the Western Hemisphere. To recognize the impact his educational leadership has had on the nonwoven fabrics industry, forum coordinator Ed Vaughn, director of Clemson’s School of Textiles, was presented “The Chairman’s Award” from INDA, The Association of Nonwoven Fabrics Industry, the industry’s professional association. Previously, only company executives had received the prestigious award.
Fifteen years from now, if Carolyn Perkins has her way, she'll be making major discoveries that will help the U.S. textile industry improve its worldwide competitive edge. "I'd like to do research," says the senior textile chemistry major. "I'd like to develop better finishes and fabrics." There are strong indications that she'll do what she says. In addition to holding one of the Clemson School of Textiles' top scholarships, she is the 1988 winner of the S.C. Textile Education Foundation Award of Merit, which annually recognizes the textile student judged to have the most potential for scientific achievement. On top of that, she spent the summer working in Milliken and Company's Pendleton Finishing Plant. Her assignment was to calibrate a near-infrared spectrometer used in the sizing, or chemical treatment, of fabric.

In pursuing a career in textiles, Perkins is following in her father's footsteps. He is Henry Perkins, a 1959 Clemson textile chemistry graduate who works in the U.S. Department of Agriculture's laboratory at the University. "My father has always worked with cotton," she says, "and that interests me, too. I'd like to work in the apparel industry or maybe with sheeting." Another Perkins daughter, Beth, is also a graduate of Clemson's School of Textiles. She earned a textile technology degree in 1983. "There's a good future in textiles," says Carolyn Perkins. "It's a solid industry. As the machinery becomes more refined and the processes become faster, it will become a more efficient industry. The question is how are we going to beat the foreign competition." One of the answers to that question is Carolyn Perkins.
The message is direct, simple and logical: A cooperative approach to basic research is sorely needed for the U.S. textile industry to be competitive in the international marketplace. As co-director of the emerging Clemson University Textile Research Center, Mike Ellison leads a coalition of industry, government and Clemson partners eager to translate the message into action. After a yearlong feasibility study, Ellison and colleagues Mel Whitley and Ed Vaughn are ready to put CUTREC into operation as the nation's only cooperative research center for the textile industry. That industry, says Ellison, is not the monolith it is sometimes perceived to be. Its components range from producers of fibers and chemicals to manufacturers of apparel, mill products and machinery. The aim of CUTREC, he says, is to get those various interests to cooperate together as well as with Clemson in a long-term commitment to fundamental, interdisciplinary research that will help all segments of the industry to prosper. "The study of textiles is very much a renaissance discipline. To understand it fully, you have to be well versed in many areas, which is one reason I find it so attractive," says Ellison, who earned a degree in engineering and two in physics before concentrating on the physics of polymer fibers for his doctorate. His own research areas include the effects of radiation on polymeric fibers, the electrical properties of polymers, and the efficiency of air filtration materials. His teaching assignments include a course in robotics, and he calls upon a talking HERO 2000 robot to help him make points in the classroom and progress in the laboratory. Away from work, he enjoys playing the fiddle. "I play traditional Irish music and traditional American dance music. I don’t play bluegrass," says this native Californian and father of two. His work at Clemson could give the textile industry something to sing about well into the future.
Private gifts for Clemson's academic programs jumped 40.2 percent in 1987-88, reaching $10.3 million and crossing into double digits for the first time in history. Unrestricted giving to the annual Clemson Loyalty Fund topped $1 million for the first time ever. A record number of individuals — 14,592 — made annual gifts to current operations. The average of these gifts was $85. Of Clemson's alumni of record, 26.5 percent — twice the national average for state-assisted schools — participated in the Loyalty Fund. New gifts were received from 1,280 donors who had never given before. Of the $10.3-million total, $5.2 million came from individuals, $3.2 million from corporations, and $1.9 million from foundations and trusts. A total of 17,878 gifts — including gifts for annual operations and for capital purposes, from individuals and from organizations — were received in 1987-88. The average gift from all sources was $399. Total expenditures relative to year-end fund-raising results indicate a cost of 10 cents to raise each dollar. The year included announcements of major gifts and bequests that will lead to the establishment or significant enhancement of The Robert and Lois Coker Trustees Chair in Molecular Genetics, The P.W. and Bobbie McAlister Trustees Chair in Advanced Engineering Materials, The Callie Jones Shirley Library Endowment, The George J. Bishop III Distinguished Professorship in Ceramic Engineering, The Milton W. Holcombe Chair in Electrical and Computer Engineering, The Prince Presidential Scholars Endowment and The James A. "Shine" Milling Presidential Scholarship Endowment. Also, the S.C. Dairy Science Association voted to raise $200,000 a year for the next five years to endow a chair in Clemson's Dairy Science Department. In addition to academic giving, gifts totaling $4.8 million for athletic scholarships contributed through IPTAY were received in 1987-88. The Athletic Academic Endowment for non-athletic scholarships, supported by the Athletic Department and by corporate matching gifts to IPTAY, now totals more than $984,000.

Coburg Dairy President Frank Hanckel, Clemson alumnus and former member of the Clemson University Foundation Board of Directors, leads the S.C. Dairy Association's efforts to raise $1 million to endow a faculty chair at Clemson.
A record 2,818 freshmen enrolled for the 1987-88 academic year. Of these, 33 percent ranked in the top 10 percent of their high school classes, 63 percent were in the top 20 percent, and 93 percent were in the top 50 percent. Their average Scholastic Aptitude Test score was 1,028, a Clemson record, and 626 were granted a total of 5,435 credit hours of advanced standing through the College Board Advanced Placement Program. The 1987-88 academic year also marked Clemson’s highest overall on-campus enrollment — 11,639 full-time and 1,231 part-time. An additional 995 students in various off-campus programs brought total enrollment to 13,865. Students at Clemson enjoyed educational experiences outside the classroom through more than 260 academic, social, sports and religious organizations. Half of these groups provide career-oriented fellowship, programs, and trips to professional conferences. Recruiters from 400 companies held 6,372 interviews with Clemson students during 1987-88. The Career Services Office provides an employer data base accessible from computer terminals across the campus. Meanwhile, the 690 students who participated during the year in the Cooperative Education Program earned more than $4.1 million. Clemson student-athletes in 1987-88 hosted and won the National Collegiate Athletic Association’s soccer tournament, were victorious in the Citrus Bowl football contest with Penn State, and won Atlantic Coast Conference championships in football, golf, men’s cross country, men’s tennis and women’s swimming. A total of 19 students were Athletic All-Americans. Clemson’s Graduate School experienced record numbers of applicants (2,709), new students (878) and total enrollees (2,902) in 1987-88. A new graduate program, the Master of Science in Applied Psychology, was approved to begin in 1988. Under the direction of the Graduate School’s Office of International Programs and Services, Clemson is significantly strengthening its efforts to promote interaction and understanding between domestic and international students.

Graduating during the Centennial, tomorrow’s leaders will shape the next century with the vision born and nurtured at Clemson.
Clemson celebrates its Centennial year with a budget exceeding $259 million versus $215.4 million during 1987-88. The state of South Carolina has demonstrated a renewed commitment to higher education this year with 93 percent formula funding versus 88 percent during the 1987-88 year. In addition the state has invested $5 million in "Cutting Edge" research, education and economic development programs for higher education institutions. The campus has strengthened its financial foundations by integrating long-range and strategic planning priorities with budgets, by adopting innovative budget management practices and by encouraging cost containment efforts throughout the University. These efforts, together with the state's new initiatives in higher education, continued improvement in PSA funding for agriculture, and continued increases in sponsored programs and gifts, will allow Clemson University to continue to develop a national reputation in a variety of program areas while contributing to the economic development of South Carolina. Progress on campus building and renovation programs continues in line with the six-year facilities program approved in September 1987, representing almost $300 million in projects. More than 40 percent of these projects valued at $110 million are already under way, including the Strom Thurmond Center represented by the institute, the performing arts center and the conference center. In addition, the state of South Carolina has provided funds to initiate a $15-million engineering innovation center, an $8.4-million central animal research facility, and renovations of Brackett Hall. Plans are under way for an East Campus activities center, a new dormitory, and an academic learning center along with renovating Johnstone Hall. Improvements in agriculture include funds for architectural and engineering work on the Edisto Research and Education Center, for replacement of a fruit research station and for renovations to Newman Hall.

A permanent home for the Strom Thurmond Institute of Government and Public Affairs will be ready in early 1989. The institute sponsors non-partisan research and public service programs aimed at enhancing civic awareness of public issues and improving the quality of American national, state and local government.
The proud tradition of America's land-grant universities is service — service in the classroom, the laboratory, and the state, national and world arenas. Land-grant institutions — through the learning, values, inventions, scientific discoveries and technology coming to us from them since the 19th century — continue to change and brighten the world for all of us. I think that Thomas Green Clemson, as one of the founders of the land-grant movement and of this great University, would indeed be very proud that his vision is being carried forward today by the achievements, dreams and vision of the Clemson people who are leading us confidently into the 21st century.

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The Robert Muldrow Cooper Library sits at the heart of the campus. During 1988 the family of Callie Jones Shirley increased the library's endowment to $1 million.
Global interdependence is rapidly becoming a clearer and more concise challenge for the United States as a whole. The reality of this opportunity demands a comprehensive response which integrates all of our American resources. Closer cooperation between higher education and business is an absolute requisite as we address the mutual concerns of economic competitiveness, R&D infrastructure and educational improvement.

The individual issues range from the rebuilding and modernizing of research facilities to the education, training and motivation of our people.

All of our creativity will be tested as we work together while respecting the traditions of academic freedom on the one hand and the need for business profit on the other hand. There has never been a more propitious moment in the history of our country for the academic and business sectors to demonstrate leadership through collaborative efforts, whether they be on a regional, national or world basis.

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