1-1-1969

President's Report to Board of Trustees, 1968-1969

Clemson University

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1968-1969
Report of the President
Clemson University
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TERM EXPIRES 1970
A. M. QUATTLEBAUM
L. D. HOLMES
E. OSWALD LIGHTSEY

TERM EXPIRES 1972
PAUL QUATTLEBAUM, JR.
W. GORDON McCABE, JR.
T. KENNETH CRIBB

The Annual Report is presented to the Trustees of Clemson University by President Robert C. Edwards for the year July 1, 1968 to June 30, 1969, and transmitted by Senator Edgar A. Brown, President, Board of Trustees, to The Honorable Robert E. McNair, Governor, State of South Carolina. Supplementary to this report are The Clemson University Catalogue, The Graduate School Bulletin, The Report of the Agricultural Extension Service and The Report of the Agricultural Experiment Station for the year.
If any single word can be applied to all higher education throughout America today it is the word *ferment*.

In every level of every institution there are, in varying degree, conditions of excitement, agitation, unrest, and even tumult—which are the dictionary synonyms for ferment.

Clemson University is no exception.

But at Clemson University, I am happy to report, ferment is being directed into useful channels and is not being allowed to divert the University from its basic missions of education, research, and public service.

Students and faculty are involved, inevitably, in the general ferment of American society. They are striving to formulate and express new and different ideas and broader ambitions.

Clemson encourages freedom of expression, for only through such freedom can a University fulfill its function of enlarging and transmitting knowledge.

But Clemson as an institution and the vast majority of individuals who comprise the institution never forget that Clemson exists to train young people for useful careers of their own and for useful service to society.

Whatever fosters the educational program of the University is being encouraged and whatever threatens to interfere with that program is being resisted.

Legitimate needs of Clemson students are the first concern of Clemson Trustees, Administration, and Faculty. Foremost among those legitimate needs is the assurance that every Clemson graduate will have the best training it is possible to provide in whatever field he has chosen to study.

Thus the basic emphasis continues, as it has from the founding of Clemson, on strengthening and broadening academic programs, to the end that every graduate may compete effectively in today's world.

Student involvement in this process is growing at Clemson, as it is everywhere. The Administration and Faculty are listening to students and encouraging open channels of communication among all elements of the University community.

Seminars, conferences, and individual conversations with students—especially with the leaders of student organizations—and student participation in appropriate committees are receiving increased attention.

Responsibilities of the Administration, however, have not been and will not be evaded.

The Board of Trustees, charged by law with establishing policy for the University, adopted in 1965 a directive proclaiming freedom of expression within the University community but forbidding any overt or violent acts which interfere with the functioning of the institution. The President is ordered and directed to enforce this policy by such disciplinary measures as he deems necessary.

This policy has been repeatedly communicated to all concerned and has been of inestimable value in promoting an atmosphere of responsibility and mutual understanding.

Within recent months the University's legal right and duty to administer its own affairs was undergirded with a significant decision from the United States District Court.

A small group of students sought to convene on the Clemson campus a regional Vietnam Moratorium demonstration to which persons unknown from places not clearly
stated for purposes unspecified would be invited. The University Administration, recognizing its responsibility for proper use of University facilities and for the maintenance of order, disapproved the proposal, whereupon students sought a Federal Court order to restrain the University from interfering.

After a full hearing and the filing of detailed briefs and affidavits, Judge Donald Russell denied the request for a restraining order. His opinion fully upheld the University's position.

Thus sustained, Clemson's Administration is addressing itself anew to the future of the University.

The past year has seen much progress. Organizationally the University is equipping itself to meet new challenges.

Three major academic divisions, Architecture, Education, and Industrial Management and Textile Science, formerly designated as Schools, are now Colleges of the University. What formerly was the College of Arts and Sciences has been divided for greater administrative effectiveness into two divisions, the College of Liberal Arts and the College of Physical and Mathematical Sciences.

Progress and growth throughout the University are described in detail in pages which follow. They record the determination of every College, School, and Department to move with the times—to anticipate change and to lead in changes for the better, rather than merely adjusting to change.

Never before has our academic program been better, our faculty stronger, our student body better qualified. At the same time we have great needs for the future and are seeking ways to meet those needs. One of our immediate concerns is the resumption of our long-range building program to provide the academic buildings and facilities for student life necessary to accommodate our steadily increasing enrollment.

I am confident that issues which unite all elements of the University community are far bigger and more basic than the issues which divide that community. All are concerned, I assume, with what is best for Clemson.

In a spirit of mutual understanding, we are determined to carry Clemson forward to higher degrees of excellence in every aspect of the University.

Robert C. Edwards,
President.
Academics
And Their Strengths

College of Agriculture and Biological Sciences

South Carolina was once a predominantly agricultural state. Today it is an industrial as well as an agricultural state; but agriculture remains a major base of the state’s economy.

The nature of agriculture, however, is changing as rapidly as are science and technology in every other phase of American life. Clemson, in its three-fold agricultural program—teaching, research, and extension—strives with much success to keep abreast of and, in fact, to anticipate and prepare for the changes with which agricultural forces of the state and nation must cope.

Major changes in undergraduate curriculums, which became effective in 1969, give a new look to agricultural teaching on the Clemson campus while retaining the best of the old. In addition to the traditional courses required in their chosen area of study, students may now select a minor specialty area by taking courses emphasizing the science, business, production, or international agriculture aspects of their major specialization field.

Students have accepted these changes so enthusiastically that almost all those who had the option of choosing old or new curriculums during the transition stage elected to follow the revised programs.

Other notable developments include:

—In-service training for professional agricultural workers to insure that ongoing programs remain of the highest calibre.

—Cooperative programs with the South Carolina State College to provide pre-agricultural programs on that campus and carefully phased transfer to the Clemson campus of degree-granting programs, so that all students enrolled in higher education in agriculture in South Carolina will receive equal training at the highest possible level.

—Two-year agricultural technology programs offered in various parts of the state in cooperation with the State Committee for Technical Education and the State Department of Education.

—Student Science Training Programs in Biology in the summers to stimulate superior high school students to consider careers in the life sciences.

On July 1, 1969, the basic biological sciences were placed in the Division of Biology in the College of Agriculture and Biological Sciences. This Division presently consists of Sections of Botany, Micro-
biology, and Zoology with the assigned mission of strengthening curriculums for undergraduate and graduate training in the basic areas of these sciences. This development permits these sections to continue in support services for agriculture and to provide the basic biology support required for other University units. The Division will emphasize up-dating of basic biological curriculums in all phases of these sciences, and will increase research activities in both basic and applied problems involving these fundamental areas of biology.

The South Carolina Agricultural Experiment Station, research arm of the College of Agriculture and Biological Sciences, is placing increased emphasis on mechanization for the state's major crops. This involves far more than the design and development of mechanical harvesters, important as they are. It involves the breeding of plant varieties and the creation of cultivation and cultural practices which will make feasible the economic use of mechanical harvesters. All phases of agricultural science must move together to achieve this end.

Labor costs and labor shortages are such that crop production and harvesting must be mechanized if profitable agriculture is to exist. Major progress is being made in the mechanical harvesting of tobacco, peaches, apples, okra, tomatoes, and snapbeans.

Other important research developments include completion of new poultry research facilities, an intensified statewide program of soil mapping, release of a new cucumber variety for pickling, and selection of the Clemson Horticultural Ornamental Grounds as an official Holly Arboretum for South Carolina.

How to market a crop profitably is as important as how to produce it successfully. More and more attention by faculty and staff is being focused, therefore, on marketing problems and opportunities. Research is being conducted into the broad structure of markets and the marketing system as well as into specific commodities. Extension specialists work with producers' groups to assemble and distribute market information while it is timely. Commodities involved are as diverse as hogs, eggs, tobacco, cotton, grains, peaches, beans, cucumbers, and seafood products. The object is to obtain for South Carolina producers the maximum possible income.

The Cooperative Extension Service, since it was established in 1914, has helped improve the living standards of thousands of families. The Service is now focusing a major effort on the needs of citizens at the bottom of the economic ladder who have been left behind by advancing technology.

A special program of great significance is directed toward the nutritional needs of low-income families. The program teaches homemakers with limited budgets how to plan, buy, and prepare nutritionally wholesome meals and to supplement food supplies with home-produced vegetables. By the end of June, 1969, person-to-person contact had been made with 3,013 families with total family membership of about 20,000.

Meantime, the Extension Service continues its basic statewide programs in all phases of agriculture, youth, and home economics.

The College's regulatory services, including livestock and poultry health, fertilizer inspection and analysis, and plant pest control, are operating at a high level of efficiency and public service.
College of Architecture

Programs embraced by the College of Architecture have achieved national recognition and are being developed with deep concern for the total physical environment of man. Thus viewed, architecture involves the design of elements varying in scale from furniture and particular buildings to cities and whole regional systems.

The College of Architecture provides professional education for the architect, city and regional planner, building contractor, and visual artist. Expanded programs of research and public service are broadening the College's scope, but care is exercised to assure a relationship between these projects and the primary teaching mission of the College.

The structure of the College includes departments of Design Studies, Building Science, Planning Studies, and Visual Studies. Each Department does a portion of the core teaching in each curriculum. All seek to maintain a climate of creativity and responsible freedom, so necessary to solve environmental problems of our time.

The College is now in its third year of transition from a five-year to a six-year professional curriculum in Architecture. The first two years are heavily weighted toward general humanistic and scientific study. The next two years provide a balance of general and professional studies, leading to the Bachelor of Arts degree in Pre-Architecture. The final two years are at an intensively professional level in the Graduate School. Upon completion of these studies the professional degree, Master of Architecture, is awarded.

Graduate students may elect a two-year program leading to the Master of City and Regional Planning degree.

The Department of Building Science offers construction and applied management courses leading to the Bachelor of Science degree in Building Construction. For the past eight years demand for graduates of this course has greatly exceeded the supply.

New dimensions in professional and public service can be expected as students collaborate in service and social action projects. In 1968 students designed and constructed a Day Care Center for Clemson and in 1969 began design and ultimate construction of a Community Center for the West Pendleton neighborhood.

Students and faculty continue their involvement in town planning and civic design studies throughout South Carolina, recent projects including those in Union and Lake City. A special grant from the State Planning Agency made possible a planning study for a new town on Lake Keowee. County planning funds were of assistance in a master planning survey for the town of Clemson.

The Department of Visual Studies involves drawing, painting, graphics, photography and sculpture. Final steps have been taken to offer a two-year graduate program leading to the Master of Fine Arts degree.
Financial support from the Clemson Architectural Foundation buttresses educational and research ventures of the College.

The future of the College of Architecture is bright if speedy relief can be provided for serious physical overcrowding. As the reputation of Clemson's architectural programs has increased, the number of persons wishing to enroll has greatly expanded. The quest for excellence—which will continue—and the limits of physical space have required limits to enrollment. With appropriate resources, the College can meet society's challenge for acceleration in education of professional architects, planners, and contractors.

College of Education

The educational systems of this country, at all levels, need more and better qualified teachers. Recognition of this need, by the University and by students enrolling here, has made the College of Education one of Clemson's fastest growing divisions.

More than 1,200 undergraduate and graduate students are preparing here for careers in education and in recreational leadership. They are taught in this College by a faculty of 38, of whom 70 per cent hold the doctorate. The faculty's work includes teaching, research, and public service.

The College prepares teachers for elementary and secondary school and college positions, with emphasis on junior college, technical, and vocational education. Prospective high school and college teachers may select from 13 different teaching fields. Graduates in Recreation and Park Administration are employed in administrative positions by industry and government at all levels.

The College of Education recognizes and strives to meet its obligations beyond the campus. Through the new Office of Educational Services, programs are planned for those already in the teaching field. Advanced study is available at centers established in cooperation with the state's private colleges. Seminars and short courses are conducted in various parts of South Carolina.

The Media Center, supported by the State Department of Education, conducts research and distributes material to vocational teachers. The South Carolina Research Coordinating Unit for Vocational Education is a cooperative venture of the College of Education and the State Department of Education's Office of Vocational Education. The Department of Elementary and Secondary Education operates a curriculum laboratory with materials and equipment used by classroom teachers and supervisors in their work. Experience in teaching and counseling is obtained by students through cooperation of public schools and other institutions of higher learning.

The Department of Recreation and Park Administration has attained national recognition as one of eleven participating universities in the National Park Trainee Program. One of the graduating seniors was selected by the National Recreation and Park Association as an intern in Washington.

Members of the Education faculty have served as consultants in public schools and colleges in five states. The Recreation and Park Administration staff has provided technical assistance to communities throughout this state in development of recreation and park facilities.
College of Engineering

Under the impact of explosive modern technology, the basic nature of engineering has changed and expanded immeasurably in recent years. Engineering education and research not only must keep pace with but must lead in the transformation. This leadership Clemson is striving with notable success to attain.

Many engineers are involved today in fields technically more diverse than the traditional ones such as civil engineering, mechanical engineering, electrical engineering and chemical engineering. To meet present and future needs the College of Engineering has instituted major changes in undergraduate curriculums, graduate education, and research programs.

The Division of Interdisciplinary Studies, established in 1968, is an example of the impact of modern planning on engineering education at Clemson. This Division concentrates on such new areas as Bioengineering and Materials Engineering which promise soon to involve significant segments of the profession.

The role of the Division of Interdisciplinary Studies is to coordinate and administer these new and exciting branches of the profession, primarily by graduate education through research, but including also undergraduate courses in Metallurgical Engineering and Engineering Analysis.

The initial faculty of two in this Division has grown to a directly-assigned staff of nine, which includes seven Doctors of Philosophy, a Doctor of Medicine, and a Doctor of Veterinary Medicine. Diverse specialities represented by this faculty include metallurgical engineering, materials science, ceramic engineering, polymer chemistry, microbiology, orthopedic surgery, and medical instrumentation.

Current research in the Division, supported by federal, state, and private funds, much of it in cooperation with medical colleges and hospitals, ranges over fields, including:

—Ceramic replacement for bone and implantable ceramic teeth.
—Metallic orthopedic prosthetics.
—Artificial heart valves.
—Water soluble glass containers.
—Effective processing of automotive scrap.
—A non-toxic substitute for lead shot which threatens the waterfowl population.

—Long range studies in Microbiology leading ultimately to more efficient methods of aqueous waste treatment and water purification.

These and many other engineering research projects are highly relevant to the needs of present-day society and to the capabilities needed by the engineer of the future.

College of Industrial Management and Textile Science

The increasing diversification of industry in South Carolina and neighboring states has brought widening opportunities to graduates from this division of the University. It also has brought new challenges to the faculty to keep its course offerings and its research abreast of changing needs.

Pioneering efforts of the 1960’s in curriculum developments have resulted in well defined programs to serve all facets of the textile industry. The most recent development is the Doctorate in Polymers and Textiles which will be offered for the first time in the fall of 1970. This is in addition to the Doctor of Philosophy degree in Chemistry.
with a major in Textile Chemistry which is offered jointly with the Chemistry Department.

Nearly all graduates in Textile Science and a large number of Industrial Management graduates enter the textile industry. The textile curriculum itself is an evolutionary development from the old Textile Manufacturing degree into the more sophisticated technological degree known as Textile Science. This College has now awarded 34 Master of Science degrees in Industrial Management and one-third of the recipients are working in textiles.

The prestigious Management degree program established in 1955 continues to be a favorite for high school students dedicated in their pursuits of the most advanced training in Management Science. Testimony to the quality of this program is revealed in the lucrative and varied opportunities awaiting Industrial Management students upon graduation. This program is one of the few Management curriculums in the United States complying with recommendations of the American Mathematical Associations.

Building on its experience and research of the 1960's the Management area will broaden its offerings in the 1970's to meet the needs of the rapidly diversifying economy of the Southeast and South Carolina in particular. Companion programs to the Industrial Management degree will be established in the fields of Accounting, Finance, and Administrative Management.

Exploratory conferences are being held with Furman University, looking toward establishing a Master of Business Administration program on the Furman campus to be presented jointly by Clemson and Furman. This is to serve the greater Piedmont area by making available advanced degrees for those who wish to continue in full time employment while doing graduate work.

Widespread travel and professional contacts by faculty members have broadened the outlook of the College. A notable example is the European tour in 1969 of Professor Edward S. Olson who visited seven nations from Sweden to England to southern France. His primary interest was to determine the academic requirements and research efforts of major universities involved with textiles and related education.
Clemson University Serves The Entire State

This outline map could not begin to show the many ways in which the University is involved in the progress of our state. Listed are but a few of the important areas:
No. Students
No. Alumni

- Clemson Campus
- Two-Year Center Campuses
- County Extension Offices
- Agricultural Experiment Stations
- 4-H Club Camps
- Livestock-Poultry Health Laboratory
- Belle W. Baruch Foundation
- Cooperative Medical Research
- Health Facilities, School of Nursing
- Cooperative Educational Programs
The Economics Department, now in its third year under administration of this College, reflects in its productivity a warm relationship between faculty and students. This is attributable to a stable staff at all levels of instruction and to Clemson's tradition of student-oriented educational programs.

Much of the Department's research has been related to water resources policy, a subject of most urgent and immediate national interest. Dr. Hugh H. Macaulay, Jr., Alumni Professor of Economics, has worked with faculty members in this and other divisions of the University to carry forward programs supported by the South Carolina Textile Manufacturers Association and the federal government as well as by the University's own funds.

An important service to industry is the Professional Development Program which results each year in self-renewal for executives and technicians from industry and for faculty members who work with them.

The annual Textile Marketing Forum again was highly successful and plans are now under way for the third of these Forums, which focus attention on increasing and broadening the consumption of textile products.

**College of Liberal Arts**

The Liberal Arts program has come of age at Clemson with creation this year of a separate College encompassing the disciplines of English, Languages, Music, and Social Sciences. This action reflects growth of interest and enrollment in the liberal arts areas and is a mark of Clemson's progress toward being a mature and balanced University.

Within the College of Liberal Arts the most important administrative step this year, with resultant strengthening of programs concerned, has been division of the Department of English and Modern Languages into separate departments, each with its own head.

The two areas, jointly administered since 1951, had grown to the point where a single department head could not administer them adequately. Both new Departments are among the most rapidly growing in the University. Languages has increased in enrollment and in staff an average of 20 per cent in each of the past ten years.

Another new administrative unit in this College is the Department of Music. Music formerly was taught in the School of Education and did not have departmental status. In addition to its teaching functions, the Department of Music will direct student activities in music, notably the Band and Glee Clubs.

Two of Clemson's newest and finest buildings, D. W. Daniel Hall and Strode Tower, house much of the College of Liberal Arts, including the dean's offices. The buildings were especially designed and are extremely well adapted to the teaching of English and other languages. Among outstanding features is a new fifty-position Language Laboratory with advanced electronic teaching equipment.

The Department of Social Sciences sponsored in 1969 its first over-
seas program, a study tour in which two history teachers conducted English history courses for 13 Clemson students in Great Britain for six weeks.

A new course, "History of Black America," is being offered for the first time in the 1969 fall semester with 60 students enrolled.

A minor concentration in Fine Arts has been established for students majoring in various liberal arts disciplines. It is staffed by faculty members from English, Visual Arts, Music, and Social Sciences.

**School of Nursing**

The School of Nursing, now in its second year of operation as a separate academic unit, is dedicated to helping alleviate the shortage of nurses in South Carolina and the southern region. More than 60 students are enrolled in the two undergraduate programs. A significant number of well qualified young people have expressed interest in enrolling in the future. In addition to those who plan to come directly from high school, an increasing number of college students are indicating a desire to transfer to the School's programs.

Professional recognition already is coming to the quality of nursing education at Clemson. The State Board of Nursing of South Carolina has granted initial approval of the baccalaureate program. The National League for Nursing has granted reasonable assurance of accreditation following a comprehensive report by the dean and a site visit by two distinguished nursing educators. This recognition commits the School to apply for full accreditation in 1972, the year the first Bachelor of Science degrees in Nursing are to be granted.

The United States Army Nurse Corps has approved the Clemson baccalaureate program for participation in the Army Student Nurse Program. This can lead to financial assistance for students and to Second Lieutenant’s commissions for some graduates in the Army Nurse Corps.

The two-year Associate Degree program in Nursing, begun in 1965 and conducted in the College of Arts and Sciences before the School of Nursing was established, has received full approval from the State Board of Nursing for South Carolina.

A strong faculty in nursing has been recruited. All budgeted positions have been filled with persons who have made significant contributions to their profession. Each is a master practitioner in her special field. Several have completed work beyond the master's degree and one is an active candidate for the doctorate.

Good resources for clinical nursing experience, an essential for the School, are provided through contractual arrangements with the Greenville General Hospital System and the Anderson Memorial Hospital. Similar arrangements will be made with county health departments.

As the School grows in size and begins to offer graduate and continuing education programs, it will require increased physical facilities.

**College of Physical and Mathematical Sciences**

This College, newly created by dividing the areas previously administered through a College of Arts and Sciences, consists of the departments of Chemistry and Geology, Mathematics, and Physics. These are departments in which Clemson has become increasingly strong in recent years. The new administrative set-up should enable the College to build on and augment these strengths.
Within the three departments important sub-units have developed in Biochemistry, Computer Science, Decision Science, and Geology. Some of these may grow in a few years into separate departments.

The Department of Chemistry and Geology is expanding Biochemistry research with augmented staff and equipment. An active research group in fundamental Biochemistry will support larger graduate programs and provide a means of relating Chemistry, Mathematics, and Physics to biological problems. A new program offers the M.S. degree in Biochemistry. Doctor of Philosophy students in Chemistry may major in Biochemistry.

The Department of Mathematics continues to attract many of the ablest students on campus, as evidenced by the fact that 11 out of 32 students receiving the bachelor's degree in Mathematics last session had a grade-point ratio better than 3.5 out of a possible 4.0; and four of these students graduated with highest honor. In addition to a program in pure Mathematics, the Department offers programs in Mathematics with options in Statistics, Computer Science, Communications, Physics, Management and Chemistry. The Department also continues to offer at all levels courses of special value to students from other departments.

The Department of Physics has instituted several options for undergraduate Physics majors which allow students to concentrate in fields of their greatest personal interest. These include Geophysics, Astrophysics, Biophysics, Chemical Physics, Electronics, Computer Science and straight Physics for those who wish to enter graduate school.

Recognizing the urgent need for more and better teachers of science, especially in secondary schools, all departments in this College have important teacher training programs. The Department of Mathematics in cooperation with the College of Education offers excellent programs for prospective teachers. It also conducted for the third year a summer Institute for Secondary Teachers of Mathematics, through which 15 participants received master's degrees.

The Department of Physics has made available to all high school teachers of Physics in South Carolina its full cooperation in improving the level of Physics instruction in high schools. This is being done through visits of high school classes to Clemson and of Clemson faculty members to the high schools. The Department of Physics and the Department of Chemistry and Geology jointly are offering a new freshman level course designed primarily for education majors. Since elementary teachers now cover some of both Physics and Chemistry in their courses, anything that improves their understanding of these subjects will be reflected in better students emerging from high schools.

Throughout the College of Physical and Mathematical Sciences the
quantity and quality of graduate work and the participation of faculty members in their professional societies have continued to increase. Faculty members have been elected to office in the Mathematical Association of America and a meeting of the American Mathematical Society was held at Clemson in 1968. Growth in stature of graduate programs is reflected by such things as an invitation for a graduate student in Physics to participate in a research seminar at Cornell University.

**Graduate School and Office of University Research**

The quality and appeal of Clemson's programs of graduate study are attested by steady enrollment growth in the face of some nationally discouraging factors. Notwithstanding uncertainties of military service for draft-eligible students, which have caused lower enrollments in many fine graduate schools, Clemson's graduate enrollment of 681 in 1968-69 represented a 6 per cent increase over the previous year.

After a decade of expansion in breadth of offerings, the Graduate School now emphasizes strengthening of its present programs. The University now offers 40 master's degree programs and 23 leading to the doctor's degree. Most of these are within individual departments but 10 are conducted on an interdisciplinary basis, that is, in subjects which cut across departmental lines.

Ten years ago Clemson was yet to award its first Doctor of Philosophy degree. In the calendar year 1967, 22 were awarded. In the calendar year 1968, the number grew to 35, and the trend continues upward. The number of master's degrees also continues to grow, with 189 being conferred in the calendar year 1968.

Graduate School enrollment depends in large measure on availability of financial assistance for students seeking advanced degrees. More than 450 Clemson students received such assistance through teaching assistantships, research assistantships, fellowships or traineehips. Two-thirds of this support was from appropriations by the State of South Carolina, with the balance coming from industrial and federal government grants.

Graduate programs, especially in the field of education, have been made available off-campus through cooperation with various local school districts and through graduate work in Management on the Furman University campus.

Improvement in Clemson's graduate programs is largely the result of bringing to the campus an increasingly talented faculty. This faculty is deeply concerned with research as well as with teaching, since research is a major part of graduate study. More than 250 faculty members are devoting a significant part of their time to research. Their work is supported by a variety of federal, state, and private
sponsoring agencies and coordinated through the Office of University Research.

A decade ago nearly all Clemson's research was conducted in the South Carolina Agricultural Experiment Station. Since then a great and still accelerating growth in engineering research has occurred, and other divisions of the University have moved in the same direction. Today every college of the University is engaged in research which represents a $6,000,000 investment in the future. In addition to publicly appropriated funds for research, the dollar value of sponsored research at Clemson has increased since 1963 from less than a half-million dollars to more than two million dollars.

Library

The most interesting innovation in the Robert Muldrow Cooper Library in 1968-69 was the installation of a computerized circulation system. In this system the record of each book circulated is transmitted to the Computer Center through data collection units at the circulation desk. At the Computer Center the transaction is recorded on a punched card. Each morning the Library receives a print-out of all books in circulation and other records necessary in the circulation system.

The change to the automated system from the old method of writing out book request forms and manual filing took many months of preparation. The new system, however, achieved four results:

1. Elimination of most of the clerical work involved in sorting and filing.
2. Provision of a quick method of circulating books and maintaining the necessary records.
3. Establishment of a system readily adaptable to a larger student enrollment and increased volume of books circulated.
4. Availability of automation that can be adapted to other areas of library activity.

The amount of money expended for library purposes was the highest in the history of the University. A ten-year comparison shows 1958-59 expenditures of $131,271 and a 1968-69 expenditure of $545,601. The latter figure does not include the Library of Clemson University at Sumter. Yet the demand for publications is almost insatiable as new courses are added and graduate work expands. Some 415 new serial titles were added as compared with 405 in 1967-68. Again this year the cooperation of the faculty in selecting publications to build the library collection was most encouraging.

During the year, Clemson requested 1,726 items on interlibrary loan from other institutions and loaned 371 items to other libraries. This figure gives some indication of the further efforts needed to increase library acquisitions to support the graduate and research programs.

Clemson is perhaps best known for its collections in the fields of science, engineering, and agriculture and most of the interlibrary loans were to smaller colleges and to industry. The Library, however, answered many requests by mail for information available in the special collections area and seventeen persons came from nine different states, including California, to make use of the manuscript collections.

Computer Center

The primary function of the Computer Center is to serve the academic and research programs throughout the University. To this
end, hardware and services are continually up-dated.

In July, 1968, the core storage of the computer was increased from 131,072 bytes to 267,144 bytes. About January 1, 1970, our disk storage will be increased by a factor of four.

Three data-processing projects are noteworthy:

1. Clemson operates an exceptionally fine class scheduling program. This program is unique in that great attention is given to the needs and desires of individual students, even though the scheduling is done by machine.

2. The Computer Center has cooperated with the Robert Muldrow Cooper Library to produce an automated circulation system, producing daily lists of books in circulation, overdue notices, and maintains statistical information on book circulation.

3. All alumni records are being placed on the computer to streamline mailing and record-keeping.

**Communications Center**

The University Communications Center works through photography, television, radio, and visual aids to serve internal needs of the University and to depict University programs to the general public.

Motion picture efforts have more than doubled in the past year, with a sizeable increase in television news releases and TV documentaries. A widely and well received recent documentary, "Knowledge . . . Not Money," produced in cooperation with Greenville Station WFBC-TV, tells the story of the Extension Service's expanded nutrition program.

In radio a newly instituted Clemson Radio News Service serves 36 stations throughout the state. A telephone communication system enables this agency to provide specialized services in spots where needed and to make hometown releases in addition to those of general interest.

Video tape activities are increasing and providing educational broadcasts for the Extension Service and the South Carolina ETV Center.

The Communications Center is steadily increasing its production of visual materials for classroom teachers. This is an area destined to grow tremendously as more and more academic areas utilize graphic aids which the Center can produce.
Enrollment And Its Quality

Steady enrollment growth and better qualified incoming freshmen continue to be the trend each new academic year at Clemson.

Total enrollment reached a new high at the opening of the 1969 fall semester with 7,021 students, of whom 6,743 were on the main campus and the remainder in centers at Sumter and Greenville. Coed enrollment also increased to a record 1,257 students, compared with 1,011 in the fall of 1968.

Enrollment comparisons of recent years follow:

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
<th>Graduate</th>
<th>Total</th>
</tr>
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<tbody>
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<td>1964-65</td>
<td>4,273</td>
<td>315</td>
<td>4,588</td>
</tr>
<tr>
<td>1965-66</td>
<td>4,622</td>
<td>400</td>
<td>5,022</td>
</tr>
<tr>
<td>1966-67</td>
<td>5,289</td>
<td>523</td>
<td>5,812</td>
</tr>
<tr>
<td>1967-68</td>
<td>5,838</td>
<td>636</td>
<td>6,474</td>
</tr>
<tr>
<td>1968-69</td>
<td>6,165</td>
<td>674</td>
<td>6,839</td>
</tr>
<tr>
<td>1969-70</td>
<td>6,203</td>
<td>818</td>
<td>7,021</td>
</tr>
</tbody>
</table>

These figures for 1969-70 include 152 students at the Sumter Center and 126 at the Greenville Center.

Among the colleges and schools, the College of Engineering had the largest enrollment in the fall of 1969 with 1,250 students, followed by the College of Education (1,108) and the College of Industrial Management and Textile Science (872). Enrollment in the various academic divisions is shown in the accompanying table.

In addition to the growing student population, another significant trend is the steadily improving quality of the freshman class. Members of the 1969 freshman class are the best prepared—based on College Board scores and high school records—of any group admitted to Clemson since such measures of academic ability have been maintained.

As a result of this improving proficiency of Clemson freshmen, the percentage of freshmen who complete their work and re-enroll for their sophomore year continues to rise. For the fall of 1969, 80 per cent of the freshmen who enrolled in 1968 re-enrolled for their second year. Fewer than 10 per cent of 1968's freshmen failed to qualify academically to return—the majority of non-returnees being absent for non-academic or personal reasons.

A substantial number of students received financial assistance in various forms in 1968. Approximately 200 were awarded academic grants and scholarships. The Office of Student Financial Aid awarded or recommended 330 long-term student loans with the average value of $700. In addition, more than 200 loan applications were processed through out-of-state agencies.

Some 2,100 students helped themselves in 1968 by participating in part-time employment programs on campus. Earnings from this part-time work exceeded one million dollars. Thus, almost one-third of the student body took part in one or more forms of student financial assistance.


<table>
<thead>
<tr>
<th>Colleges/Schools</th>
<th>Main Campus Enrollment Fall Semester</th>
<th>Associate</th>
<th>Bachelor's</th>
<th>Master's</th>
<th>Doctorates</th>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and Biological Sciences</td>
<td>767</td>
<td>116</td>
<td>28</td>
<td>5</td>
<td>149</td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>345</td>
<td>54</td>
<td>1</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arts and Sciences</td>
<td>1,108</td>
<td>185</td>
<td>19</td>
<td>47</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>1,250</td>
<td>189</td>
<td>51</td>
<td>6</td>
<td>246</td>
<td></td>
</tr>
<tr>
<td>Ind. Mgt and Textile Science</td>
<td>872</td>
<td>208</td>
<td>19</td>
<td>3</td>
<td>230</td>
<td></td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>799</td>
<td>17</td>
<td>5</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td>57</td>
<td>17</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. and Mathematical Sciences</td>
<td>697</td>
<td>16</td>
<td>4</td>
<td>5</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Graduates and Others</td>
<td>848</td>
<td>962</td>
<td>174</td>
<td>33</td>
<td>1,186</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>6,743</strong></td>
<td><strong>962</strong></td>
<td><strong>174</strong></td>
<td><strong>33</strong></td>
<td><strong>1,186</strong></td>
<td></td>
</tr>
</tbody>
</table>

Degrees awarded since 1896 total 21,688 of which 68 have been associate degrees; 20,153 bachelor's degrees; 1,311 master's degrees; and 136 doctorates.
## Financing And Its Sources

### CURRENT OPERATING FUNDS EDUCATIONAL AND GENERAL

#### WHERE THE MONEY CAME FROM

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encumbrances, Deferred Income and Restricted Funds Balance</td>
<td>$1,341,518</td>
<td>6.5%</td>
</tr>
<tr>
<td>State Appropriations</td>
<td>$8,637,188</td>
<td>41.8%</td>
</tr>
<tr>
<td>Federal Funds (Morrill-Nelson)</td>
<td>$126,754</td>
<td>0.6%</td>
</tr>
<tr>
<td>Student Fees</td>
<td>$2,741,565</td>
<td>13.3%</td>
</tr>
<tr>
<td>Research Grants and Contracts, Institutes and Training Grants</td>
<td>$1,310,212</td>
<td>6.4%</td>
</tr>
<tr>
<td>Sales, Services, Grants-In-Aid and Miscellaneous Income</td>
<td>$882,134</td>
<td>4.3%</td>
</tr>
<tr>
<td>Auxiliary Enterprises and Related Activities</td>
<td>$5,603,095</td>
<td>27.1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$20,642,466</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

#### HOW THE MONEY WAS USED

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction and Departmental Research</td>
<td>$8,243,185</td>
<td>42.6%</td>
</tr>
<tr>
<td>Sponsored Research and Institutes</td>
<td>$1,267,748</td>
<td>6.5%</td>
</tr>
<tr>
<td>Library</td>
<td>$502,316</td>
<td>2.6%</td>
</tr>
<tr>
<td>Physical Plant Maintenance</td>
<td>$2,117,980</td>
<td>10.9%</td>
</tr>
<tr>
<td>Student Services</td>
<td>$736,807</td>
<td>3.8%</td>
</tr>
<tr>
<td>Administration and General Expense</td>
<td>$989,224</td>
<td>5.0%</td>
</tr>
<tr>
<td>Auxiliary Enterprises and Related Activities</td>
<td>$5,532,990</td>
<td>28.6%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$19,360,250</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Funds for Encumbrances, Deferred Income and Restricted Funds Balance  

**GRAND TOTAL**  

**$20,642,466**

### PUBLIC SERVICE ACTIVITIES

#### WHERE THE MONEY CAME FROM

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Appropriations Balance</td>
<td>$177,627</td>
<td>1.8%</td>
</tr>
<tr>
<td>Operating Revenue Balance</td>
<td>$138,617</td>
<td>1.4%</td>
</tr>
<tr>
<td>State Appropriations</td>
<td>$4,953,672</td>
<td>50.1%</td>
</tr>
<tr>
<td>Federal Appropriations</td>
<td>$3,755,612</td>
<td>38.0%</td>
</tr>
<tr>
<td>Sale of Farm Products</td>
<td>$485,286</td>
<td>4.9%</td>
</tr>
<tr>
<td>Other Sales, Services and Grants</td>
<td>$381,175</td>
<td>3.8%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$9,891,989</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

#### HOW THE MONEY WAS USED

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Research</td>
<td>$3,797,540</td>
<td>42.5%</td>
</tr>
<tr>
<td>Agricultural Extension Service</td>
<td>$4,090,365</td>
<td>45.7%</td>
</tr>
<tr>
<td>Livestock-Poultry Health Service</td>
<td>$805,074</td>
<td>9.0%</td>
</tr>
<tr>
<td>Crop Pests and Disease Eradication</td>
<td>$128,590</td>
<td>1.4%</td>
</tr>
<tr>
<td>Fertilizer Inspection and Analysis</td>
<td>$123,400</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$8,944,969</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Funds for Encumbrances, Deferred Income and Restricted Funds Balances

**GRAND TOTAL**  

**$9,891,989**

### STUDENT AID

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan Funds</td>
<td>$39,275</td>
</tr>
<tr>
<td>Scholarships, Training Grants, Fellowships and Institutes</td>
<td>$596,675</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$635,950</strong></td>
</tr>
</tbody>
</table>

#### HOW THE MONEY WAS USED

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Loans</td>
<td>$47,544</td>
</tr>
<tr>
<td>Grants for scholarships, fellowships and special purpose stipends</td>
<td>$506,298</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$553,842</strong></td>
</tr>
</tbody>
</table>

1 Does not include student financing through United Student Aid Funds, Inc., commercial educational lending agencies, athletic grants-in-aid or graduate assistantships. Funds received and expended for graduate assistantships are reflected in "Educational and General."
The Future And Its Needs

As a state institution Clemson University receives its basic financial support from appropriations made by the state government. These appropriations are supplemented to an important extent by students' fees, grants from the federal government, and both gifts and research grants from alumni and other private individuals, businesses, and foundations. Each of these sources is important, for all are needed to maintain the quality of Clemson's educational program and to make possible continued growth in enrollment.

Fortunately for Clemson and for the state it serves, the General Assembly and other public officials of South Carolina are fully cognizant of the importance of higher education. They have recognized in increasing measure each year the needs of Clemson and other educational institutions. They know that the health of the state's economy and the well-being of its people depend more on education than on any other factor.

As a result the General Assembly has made provisions which are generous, considering the resources of the state, for the growth and improvement of Clemson's academic, research, and public service functions. Clemson is confident that such support will continue and be enhanced in the future.

This will be necessary if college education is to be kept financially within the reach of the people who need it. Students and their parents cheerfully pay the fees which are necessary to balance the University's budget; but to increase these fees significantly would deprive many qualified students of the opportunity to attend Clemson.

Clemson alumni, through their Loyalty Fund program of annual giving, demonstrate their belief in Clemson's future and in its goals of excellence. A total of 4,984 alumni, the largest number ever, made gifts to the Loyalty Fund in 1968. In its 13-year history, the Clemson Alumni Loyalty Fund has provided more than $1.5 million for such purposes as scholarships, faculty development and research, graduate education, student activities, permanent endowment and University contingencies.

Clemson's greatest financial need now is for capital funds with which to resume the University's building program. An urgent request for permanent improvements to cost an estimated $58,786,000 is in the hands of the Budget and Control Board and the General Assembly.

Major items in the list include a University Union and student activities facilities, a Biological Sciences building, an administration building for the College of Agriculture and Biological Sciences, a Forestry building, laboratories for Electrical and Mechanical Engineering, enlargement of the College of Architecture building and the Agricultural Engineering building, and extensive renovation of several older buildings to meet the needs of various Colleges and Schools.

These needs must be met if Clemson is to discharge its mission properly. The building program which provided many fine structures now on the campus has been brought to a standstill by limitations on bonded indebtedness, high interest rates, and the stringency of the bond markets.

The University is fully aware of the difficulties which these conditions present throughout the state government; but the University is confident that the state will find a way to do what is absolutely necessary.

With the continued support it deserves and surely must receive, Clemson University faces the future with confidence and eagerness to serve.