1973

Annual Report of the Clemson Board of Trustees, 1972-1973

Clemson University, Board of Trustees

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**CLEMSON UNIVERSITY LIBRARY**

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This report presents a comprehensive look at Clemson University and the myriad of activities throughout the institution during the 1972-73 academic year.

Although Clemson is in its 81st year of service to the people of South Carolina, the threefold mission of the land-grant university—teaching, research, and public service—remains the same today as it was in July 1893 when Clemson opened its doors.

That day was the realization of a dream come true for Thomas Green Clemson, a man of wisdom and courage, who, almost a century ago, saw the great need in South Carolina for a scientifically oriented institution of higher learning to provide the state's young people with the training which was needed to build a better society.

So strongly was he committed to the need for such an institution that he bequeathed his land and other real and personal property to the state for use in establishing the "high seminary of learning" he envisioned.

Mr. Clemson was a scientist and agriculturalist who came to South Carolina from Pennsylvania in the 1830's and married a daughter of John C. Calhoun, a foremost statesman in South Carolina history and Vice President of the United States from 1825-32.

In 1889, the year following Mr. Clemson's death, the South Carolina General Assembly accepted the terms of Mr. Clemson's will and, following the decision of the U. S. Supreme Court to uphold the will, the State of South Carolina and the full Board of Trustees proceeded to convert the dream of Thomas Green Clemson into the reality of Clemson Agricultural College.

The college also was established under the Morrill Land-Grant Act passed by the National Congress in 1862. Clemson therefore is a member of the national system of State Universities and Land-Grant Colleges.

As the years have passed, the scope and mission of Clemson University's service to the state and the nation have enlarged.
Institutions, like individuals, do not stand still. Today Clemson pursues teaching, research and public service in those areas most often associated with a land-grant university actively seeking to meet the needs of the people it serves. As those needs have varied or changed, Clemson has adjusted its capabilities for service.

In 1964, in recognition of expanded offerings of the institution not only in the areas of agricultural and mechanical arts but also in the sciences and arts, the name of the institution was changed to Clemson University.

The University now has nine colleges and the Graduate School. The colleges are Agricultural Sciences, Architecture, Education, Engineering, Forest and Recreation Resources, Industrial Management and Textile Science, Liberal Arts, Nursing, and Physical, Mathematical and Biological Sciences.
ACADEMICS

College of Agricultural Sciences
_Luther P. Anderson, Dean_

College of Architecture
_Harlan E. McClure, Dean_

College of Education
_Harold F. Landrith, Dean_

College of Engineering
_Linvil G. Rich, Dean_

College of Forest and Recreation Resources
_W. H. Davis McGregor, Dean_

College of Industrial Management and Textile Science
_Wallace D. Trevillian, Dean_

College of Liberal Arts
_H. Morris Cox, Dean_

College of Nursing
_Geraldine Labecki, Dean_

College of Physical, Mathematical and Biological Sciences
_Henry E. Vogel, Dean_

Graduate School and University Research
_Arnold E. Schwartz, Dean_
COLLEGE OF AGRICULTURAL SCIENCES
Resident Instruction

Degree Programs

Instruction in agriculture basic to South Carolina's needs is completely in harmony with the purpose of Clemson University as outlined in the will of Thomas G. Clemson and in the Morrill Act of 1862, which established the land-grant colleges.

The population of the nation and the world continues to increase significantly, requiring greater quantities of food and fiber. To meet this demand, a larger number of college agricultural graduates will be needed.

The total agricultural industry is dynamic and complex. The College of Agricultural Sciences is continuously revising and modernizing its educational programs to ensure that graduates will be properly prepared for future demands. For instance, students in many curricula now can specialize by choosing a minor in Science, Business, Production, International Agriculture, or Environmental Science. In addition, a student may select a minor in a second department, or a department other than the one in which he is majoring. This minor may be in the College of Agricultural Sciences or in one of the other colleges of the University.

A significant expansion of the equine teaching program is needed. South Carolina has long been a major winter training area for horses with most training activities concentrated in Aiken and Camden. In the last few years interest in the family horse used primarily for recreation has increased tremendously. Currently there are 65,000 horses in the state. Twenty-five hundred boys and girls are enrolled in 4-H horse projects. Qualified graduates are needed to work with the county groups as a part of the extension program, while students with specialized education also are needed to work with other aspects of the total horse industry. Recent experience indicates the number of students interested in this instructional program will increase markedly.

In order to meet more adequately the needs of students and the total agricultural industry, three new degree programs have been established. Two of these (Economic Biology and
Agricultural Mechanization and Business) lead to the Bachelor's degree and the third (Nutritional Sciences) to the Master's degree. The curriculum in Agricultural Mechanization and Business is designed to provide an educational program for undergraduates who desire a combination of training in topics related to mechanization and business management. The Economic Biology curriculum was developed by the College of Agricultural Sciences in order to discharge its instructional responsibilities in economic or applied biology. It includes concentrations in Economic Zoology, Entomology, and Plant Pathology. The Master of Nutritional Sciences provides students an opportunity to pursue a graduate program for applied or public service oriented employment as distinguishable from the M.S. or Ph.D. programs which traditionally have prepared students for research oriented professions.

Two-year Agricultural Technology Programs

Since 1966-67 the College of Agricultural Sciences has cooperated with the State Board for Comprehensive and Technical Education and the State Department of Education in conducting two-year programs in agricultural technology at selected technical education centers. The role of the College primarily involves curriculum planning and development, and program evaluation. In addition, the College assists in program operation by making available the research programs and facilities at Clemson and the branch experiment stations for class field trips, laboratory sessions, and demonstration purposes, and by providing instructional staff at cost as necessary and feasible for successful program operation. Currently eight two-year programs in agricultural technology are offered at seven state technical education centers. Enrollment in the two-year curricula has been increasing rapidly—from 88 in 1969-70, to 198 in 1971-72, and 255 in 1972-73. Job opportunities and salary levels for graduates of the technology curricula have been very good.

Continuing Education

Modern agriculture is a rapidly changing industry. The fast pace of the adoption of new technology and the application of new research findings in modern agriculture and rural
living necessitates a program of continuing education for professional educators and other agricultural workers to ensure that ongoing programs are timely. Personnel associated with agriculture and rural living in this state who especially benefit from continuing education programs include the county staff of the Cooperative Extension Service, vocational agriculture teachers, Soil Conservation Service personnel, State Land Resources Conservation Commission personnel, members of agricultural organizations and agencies, farmers, and other special groups.

There are two basic concepts of continuing education. The first is the use of programs as a means of constantly updating professional educators and other agricultural workers in the specialty areas in which they were professionally trained and are employed. To meet this type of need, periodic workshops and short courses are held in areas such as animal science, dairy science, and horticulture. The second concept of continuing education places emphasis on providing specialized educational programs on subjects of immediate or impending importance such as occupational safety, food safety standards, environmental protection, and specific plant or animal disease control. Participants in such programs are then in a position to conduct further educational programs in these topical areas. Both of these concepts have been emphasized in planning continuing education programs in the College of Agricultural Sciences.

In-service training programs in agriculture were expanded significantly in 1968-69 as a result of a special State appropriation; however, the appropriation for this program has remained at the same level since then. Continuing education activities in the College currently encompass special in-service training programs for Cooperative Extension Service personnel and vocational agriculture teachers in areas considered to be of greatest current importance. During the 1972-73 fiscal year, 26 programs were conducted in the areas of communications, general agriculture, home furnishings, horticulture, and resource development. Approximately 650 professional agricultural workers participated in these programs.

The College also conducted many other types of continuing education activities during 1972-73 such as seminars, conferences, and workshops for a wide variety of professional
personnel. These programs covered such subject matter areas as a butterfat testers short course, a pesticide chemicals school, a nurseryman's short course, and similar types of specialized continuing education activities.

**COLLEGE OF ARCHITECTURE**

The growth of state development in South Carolina is unprecedented, and shows much economic and physical promise; however, unplanned growth and development is hazardous. The College of Architecture—dedicated to functional, economic and beautiful physical development—leads and responds to these challenges as it has in an accelerating manner since 1956.

In 1956 the dollar volume of construction in South Carolina was only $246 million. By 1972 this volume had soared to $1,322,000,000, representing a six-fold increase. Translating these sums into "real money" based on the 1956 Cost of Living Index, the 1973 total has risen to $1,437,000,000. This fantastic increase in building construction indicates clearly the healthy activity of the industry and corresponds directly to the activities of those in the environmental design professions served by the College of Architecture: building contractors, architects, planners and developers.

During the period ending with the academic year of 1972-73, the College of Architecture reacted annually to the industry's need for the education of more and better trained professionals. Responding further to this need, the College has added a curriculum in Building Construction, lengthened its Architectural curriculum to six years, and developed a graduate program in City and Regional Planning.

**Enrollment Expansion**

The expansion of enrollment parallels the professional opportunities in the state and region. In 1956, a total of 132 students were enrolled in architecture; and in 1970 there were 319 students, including 10 graduate students; and in 1972, of 331 students, 20 were at graduate level. By the fall of 1973, the number had increased to 530 with a graduate enrollment of 76.
Concurrent with this growth in enrollment, the College has expanded its research and public service activities each year and has carefully integrated these facets of the programs with its primary teaching mission. Thus, research and public service have become the vehicles for graduate education, the students being immersed in “real world” problems and confronted with responsibility in a developing state and region. These activities have been an invaluable service to South Carolina communities.

A major addition to the College of Architecture is expected to be completed by the late spring of 1974, but the College requires more faculty members and considerably more equipment to conduct its graduate studies and to continue its successful programs in public service and research.

**Overseas Graduate Center**

Steps were initiated in late 1972-73 to develop a graduate overseas center in Genoa, Italy for research and urban studies. Physical facilities are being provided by the Clemson Architectural Foundation, and student tuition and faculty salaries are the same as those on the main campus. The program will be an invaluable enrichment to student education and to faculty development. The center will be used during periods when students are not in attendance for short travel courses for design professionals in the state, thus expanding the public service capabilities of the College of Architecture.

The Clemson Architectural Foundation has continued to provide modest funds for visiting lecturers and critics, field trips, student aids, exhibits, and other needed projects. It continues to have beneficial effect on student morale and in developing a healthy collaboration between the College and the practicing professionals in the state and region.

As a part of the academic master plan for the College of Architecture, the development of a graduate curriculum in Landscape Architecture has been proposed as a state need and has been approved by the State Commission on Higher Education. During the past academic year, an Ad Hoc Committee has been studying Landscape Architecture curricula in the country and assessing the need for one in South Carolina, as well as the resources currently available here for its devel-
opment. It is proposed that immediate steps be taken to implement such offerings, which will complement the programs in Architecture, City and Regional Planning, and Visual Studies to round out the spectrum of curricula for the environmental design professions in the state. There is a great need to serve and to educate students to solve the physical problems of the state. However, greatly expanded resources must be found to permit the goals and objectives of the College to bear fruit.

COLLEGE OF EDUCATION

During the 1972-73 year the College of Education completed its seventh year of service as an academic unit of the University. Enrollment reached a peak during the spring semester with 2,481 students registered in courses. The College offered 21 undergraduate curricula and graduate programs in 15 specialty areas. For the first time the College awarded more masters degrees (344) than it did bachelor's degrees (279). Recruiters from more than 40 schools and school districts interviewed graduates for positions ranging from kindergarten through college levels.

Program Goals

More requests were made for College of Education services and programs than in previous years. In assisting the State to reach its established educational goals the College placed emphasis upon the following areas:

- Preparing teachers and counselors and developing materials to assist in reducing public school dropouts.
- Preparing teachers to deal with children with physical, mental, and emotional handicapping conditions.
- Preparing teachers for vocationally-oriented careers.
- Providing inservice training for public school and post secondary personnel.
- Preparing teachers and specialists to work with the developing vocational, technical, and community college system.

Inservice Training

College of Education faculty taught 109 special institute inservice courses designed to improve the competencies of the
2,014 educators who enrolled. The College began its graduate program at Piedmont Technical Education Center in Greenwood where 33 courses enrolling 810 students were taught. The five cooperating colleges—Columbia, Erskine, Newberry, Presbyterian and Wofford—offered 23 courses for Clemson graduate credit.

Cooperative arrangements were signed by the University with Anderson College and with Central Wesleyan College to provide military science programs.

The Department of Industrial Education faculty conducted workshops, conferences, institutes and special courses for 310 teachers in the state. The impact of these activities was experienced by more than 12,000 high school students in 40 counties.

Four inservice seminars for vocational agriculture teachers were held in cooperation with the College of Agricultural Sciences during June, 1973. These seminars were strategically located at Clemson, Winnsboro, Florence, and Walterboro. The topic was “Current Situation and Future Outlook for Agriculture,” which attracted 96 teachers.

Agriculture teachers who supervise student teaching in local schools are receiving periodic inservice education to develop increased proficiency. This inservice effort is in addition to the graduate level course for those who plan to become supervising teachers. Also, staff members from the Department of Agricultural Education provide weekly intensive supervision during the period of student teaching.

Five two-day workshops in agricultural mechanics were conducted for increasing competence in oxy-acetylene welding. These workshops were held at Woodmont High School, McDuffie High School, Colleton County Area Vocational Center, Barnwell Area Vocational Center, and Florence Area Vocational Center. A total of 80 vocational teachers, including three T & I teachers, attended sessions.

Four training sessions on FFA Operation Update for teachers were held in the four supervisory districts. Local teachers and their FFA Chapter officers strengthened their leadership capabilities and learned about new FFA policies and procedures.

Two Agricultural Education courses in agricultural me-
chanics, one at Florence and one at Laurens, were taught off campus for the first time during the past year. A new state contest in agricultural mechanics was held at Clemson in April.

Vocational Institutes

An Educational and Professional Development Institute held during the summer of 1973 brought 59 teachers of vocational industrial education to the campus for courses which were designed to up-date them in instructional and industrial technology. These teachers received instruction from ten outstanding educators and had 29 field trips to industrial plants in South Carolina, North Carolina and Georgia. During the six weeks these participants developed 17 self-instructional programs to be used in their high school teaching.

An EPDA Summer Institute for Training Diversified Shop Teachers was conducted by the Department of Agricultural Education in July, 1972. The six-week institute was designed to upgrade 15 teachers of vocational agriculture and enable them to acquire the necessary skills and competencies to become diversified shop teachers.

Curriculum Projects

A graphic arts curriculum project, begun two years ago involving all graphic arts teachers in South Carolina, was completed in July, 1973. The curriculum guide, based on performance objectives, identified topics which required some type of audio-visual materials. During the past year the Department of Industrial Education developed 30 individualized learning packets, including slide sets and audio tapes for the graphic arts program in South Carolina. These learning packets are being reproduced in quantity for distribution nationally to all graphic arts teachers.

The Department of Agricultural Education has developed behavioral objectives for all undergraduate courses in the professional sequence. Similar objectives have been developed for most of the graduate courses. Learning activities are being developed to accomplish the course objectives. New approaches to learning activities include learning packages, a carefully
prepared combination of visual and sound materials with exercises to develop the attending skills for the objectives involved.

Special Activities and Awards

The annual Clemson Reading Conference was held in October with about 600 elementary and secondary teachers and supervisors attending.

The Departments of Military Science and Aerospace Studies sponsored the annual Tiger Drill Meet which provided competition between drill units of Junior ROTC units located at high schools throughout the state. More than 20 high school units sent teams to the Meet.

One of the highlights of the ROTC year was the selection of Clemson student Joseph F. Anderson as the nation's outstanding Army ROTC graduate for 1972 and the recipient of the coveted Hughes Trophy. Lt. Gen. Harris W. Hollis (Clemson '42), representing the Department of the Army, presented the six-foot trophy to President Edwards in June, 1973.

The Vocational Education Media Center received the annual award for outstanding educational programs from the Association for Educational Communication and Technology of South Carolina for developing and distributing instructional materials for use in the vocational education classrooms in South Carolina.

COLLEGE OF ENGINEERING

The College of Engineering is educating students to make a positive contribution to the world of today as well as the future. Through an interlocking combination of teaching, research, and continuing education, today's student is grounded in the basics of his discipline, looks to the future through work with faculty research projects, and has available a continuing education program to keep his professional skills current after graduation.

The future is bright for engineering graduates as the College of Engineering looks for new applications of concepts through interdepartmental and interdisciplinary programs with other academic fields of study.

Almost every decision an engineer now makes has an im-
pact on the citizens of South Carolina and the nation. Consequently, growth in the quality and scope of services to the state has been and is a keynote for the College.

THE ACADEMIC PROGRAM

Dual-Degree Program With Wofford College

Under a cooperative agreement, the first of its kind in the College of Engineering, students at Wofford College can be awarded a bachelor of arts degree from Wofford and a bachelor of science degree from Clemson’s College of Engineering in five years of study. This program will produce a graduate trained for an engineering career and concerned about the application of his technological talents to the state's problems. The dual degree program is a diversification which may be the beginning link in a network joining Clemson University’s undergraduate engineering programs with liberal arts colleges throughout the state.

Instruction

Through its teaching programs the College of Engineering works to meet the manpower needs of the state. A dedicated teaching faculty combining classroom work with research prepares the engineering student to recognize the state’s problems and needs and to contribute to their solutions.

The impact of the computer on society in general and in the area of education in particular cannot be overstated. A pilot program developed by Electrical and Computer Engineering with the University’s College of Education and the State Department of Education has focused on course enrichment in high school mathematics and science classes. This is achieved through the addition of interactive computing to the high school curriculum by means of a direct communications hook-up with the College of Engineering.

This project grew out of a $250,000 Self Foundation Grant to equip an instructional systems development laboratory on the Clemson campus. The laboratory has been established to investigate students’ learning processes and to promote more efficient teaching techniques at all educational levels.

These projects are among many which underscore the Col-
lege's development of a unique computing capability under a National Science Foundation grant of more than three-quarters of a million dollars.

Realizing that the learning process requires a student's active participation, the College of Engineering encourages innovative approaches to teaching in both undergraduate and graduate programs.

An exciting agreement between the University's Division of Interdisciplinary Studies and the Department of Orthopedic Surgery at Richland Hospital in Columbia will expose Clemson students to a medical environment on an internship basis and provide training for orthopedic residents in biomaterials and biomechanics in Columbia and throughout the state.

In this clinical environment orthopedic residents and graduate students in engineering will conduct research on defects in walking and evaluate the procedures used to alleviate these problems.

Combining the practical with the theoretical, chemical engineering students are basing their design projects on data collected at the local Deering Milliken plant in a new work/study program.

A similar internship for students in mechanical engineering has produced designs for a hospital delivery room timer now being developed for commercial production. A student's suggestion for positioning and cementing strips of skin for skin grafts is being tested at the Medical University of South Carolina.

Self-paced instructional materials are being developed by College professors for use in their own classrooms and for training off-campus specialists.

The Department of Environmental Systems Engineering is assisting the Environmental Protection Agency in preparing instructional materials for people across the country who train wastewater treatment plant operators. At the request of the South Carolina Pollution Control Authority and the South Carolina Board for Technical and Comprehensive Education, a workshop will be set up to brief instructors in the state on the use of these materials.

Under a civil engineering research grant the needs for con-
continuing education of small contractors will be surveyed. Based on this study, a self-paced educational program will be designed, utilizing a slide projector with sound. This program will be mailed to contractors for use in field offices since it is often difficult for contractors and their employees to leave the job for continuing education.

Degree Programs

The College of Engineering has enjoyed a long tradition of undergraduate education and has seen successful development and growth of graduate programs within the last ten years.

More than 1,000 students are enrolled in the eight undergraduate programs leading to the bachelor of science degree. Baccalaureate degrees are offered in Engineering Analysis and Engineering Technology as well as the traditional engineering fields.

The master of science degree is awarded in twelve fields. There are currently 158 master's candidates. The professional degree of master of engineering is available in eight of these areas. Fifty-five students are seeking doctoral degrees in 11 areas.

RESEARCH

The days when man needed to be concerned only with food, clothing, and shelter on the simplest terms are past. In today's crisis-oriented society the spectrum of man's concerns has become more complex. Mass communications announce these problems to citizens of the state and nation. These highly publicized problems hold the attention of many of Clemson's researching engineers while others concentrate on research equally as important, but less dramatic.

The College of Engineering spent more than 1.25 million dollars from federal, state, and industrial grants last year on research projects. In addition, substantial gifts and equipment loan programs from industry and federal agencies has significantly expanded the College's research capabilities, especially in the computer simulation of industrial processes. Since 1960 the College has received almost $6,500,000 in grants and gifts from a variety of sources.
The Energy Crisis

With much-needed attention given the energy crisis, it is appropriate that one of the goals of the College has been the development of a program in energy conversion.

A new course grouping, coupled with aggressive research efforts, is seeking short and long term solutions. The problems of fossil fuel shortages, nuclear construction delays, and environmental impact make this emphasis especially important.

Because natural gas, the cleanest of fuels, is in short supply, researchers in mechanical engineering are examining vegetable matter as a source of synthetic fuel. Agricultural and logging wastes or a specially grown energy crop may provide the answer.

The siting of power plants is based on a wide variety of factors, including availability of resources, costs, environmental considerations, and social and political impacts. Engineers are compiling information which will show the interrelationships of all these factors and aid the power industry in making decisions about plant location. Projections of power supply and demand also can be made from this information.

A one-step process for changing coal into more efficient liquid or gaseous fuels could eliminate the bad effects of strip mining and turn economically unrecoverable veins of coal into a future source of energy. A chemical engineer's research may find application in the future by introducing a catalyst into a deep vein after drilling to produce liquid or gaseous fuels.

Other research efforts are directed toward energy conservation, plant design, power distribution, and storage lakes for production of electricity during periods of heavy demand.

The Environment

As South Carolina's population and industrial capacity continue to expand, pollution problems will increase. Because better ways of reducing, disposing of, or controlling the impact of waste products on the environment are currently available, engineers throughout the College are giving serious attention to a wide range of pollution problems. Research is concerned with finding solutions which will serve all sectors of society.
Studies range from the environmental impact of power development in the Piedmont to wastewater disposal along the Grand Strand.

Thermal pollution, textile waste reclamation, the use of dredge spoil to make bricks, the filtering of flue gases, a water resources data management system, the training of water treatment plant operators, nuclear waste management, and the design of nonpolluting manufacturing processes are a few of the research efforts in this area.

**HEALTH**

Medical related research covers a wide spectrum. Emphasis varies from the most basic search for new knowledge to the application of current technology.

The latest and largest current research contract in the Division of Interdisciplinary Studies—$238,000 from the National Institute for Dental Research—is aimed at alleviating the problems of toothlessness. With increased life expectancy, the need for artificial teeth implants which function as natural teeth increases since lack of teeth in the aged and ill often aggravates other health problems.

Although the artificial heart valve has permitted many men and women to return to productive activity, the blood is damaged by turbulence as it passes through the valve. Current studies are directed at demonstrating that agents can be introduced to smooth the flow without harming the patient.

Treatments for burns, a mechanical system for the removal of cataracts, knee braces, and materials to aid the plastic surgeon are being refined. Successful research with application to the heart-lung machine, to the development of an artificial kidney, and to the transfer of oxygen to tissue could mean dramatic breakthroughs in the medical field.

As the result of health-related research, a new statewide emergency medical communications system will be based on a study by Clemson engineers. The report sets up criteria for an orderly transition from local radio systems on incompatible frequencies to a system which will permit direct radio communications between all hospitals, ambulances, and dispatch centers.
Food, Clothing, Shelter

These basic needs are continually on the minds of researchers.

Development of efficient machinery for harvesting produce will bring food more economically to the consumer. Other research is involved with direct-seeding planting and cultivation systems for vegetable crops.

The economic development of shrimp aquaculture and production of artificial seedbed materials for supporting oyster production will provide more seafood to South Carolina's tables.

By designing equipment and improving industrial processes, researchers stimulate economical production in the textile industry.

The need continues in the state for inexpensive housing. New materials and new systems of construction are being developed to provide quality housing at reasonable costs.

CONTINUING ENGINEERING EDUCATION

Since 1967 the College of Engineering through its continuing engineering education program has been reaching out from the campus to provide educational services throughout the state. During the past year almost 3,000 engineers and other professionals and specialists paused in the midst of their professional careers to enroll in 32 short courses, evening classes, seminars, and symposiums.

These courses provide concentrated periods of study in which participants learn the latest technological advances in their fields, learn new research results and better ways to help solve today's problems. For many South Carolinians continuing engineering education presents the only available opportunity to freshen their professional outlook.

Seminars on and off campus featured topics relevant to the state's current problems and concerns. Discussions of occupational health, recycling and disposal of all kinds of waste, building design, safety regulations, highway construction were among the pertinent subjects dramatized.

Evening graduate courses, the newest addition to the continuing engineering education program, enable the engineer
to study for an advanced degree without returning full time to campus. As a result of this program 64 new graduate students have enrolled in the Graduate School.

Attendance at these service-type programs has grown rapidly in recent years. More than 7,500 officials and specialists have participated in 107 programs over the past seven years. Almost half of this enrollment has occurred since September of 1971.

Enrollment more than doubled during 1972-73. About 60 per cent of this year's enrollment came from South Carolina; however many of the programs are regionally and nationally recognized for their excellence. Participants during the year came from 42 states and 15 foreign countries.

COLLEGE OF FOREST AND RECREATION RESOURCES

The year 1972-73 marked significant progress for the College of Forest and Recreation Resources toward its three-fold commitment to education, research, and public service in Forestry and in Recreation-Park Administration.

Education

The College's first charge is to teach the techniques and the philosophy of the professions represented in Forest and Recreation Resources to those students who seek to enter the fields of Forest Management, Recreation and Park Administration, and Wood Utilization. Enrollment continues to increase steadily, indicating that today's environmentally and socially aware young people recognize these as frontier fields where they can make contributions in improving the environment and the quality of life for people now and in future generations.

To meet needs of the increased enrollment and to keep abreast of changing demands of the professions, several specific accomplishments and activities took place during the year.

A new program in Wood Utilization was approved by the South Carolina Commission on Higher Education, to be implemented in the fall of 1973.

The Department of Recreation and Park Administration
initiated three undergraduate emphasis areas, and the Department of Forestry's emphasis areas initiated last year began to function well as students and faculty became accustomed to the new approach.

To serve the greater University, elective courses of campus-wide interest were reshaped to more nearly meet the needs of the students served, and some new courses were initiated.

Forestry students in particular are increasingly interested in and involved with use of the computer as a tool in studying complex forestry problems and decisions.

The graduate program in Recreation and Park Administration, begun last year, grew rapidly. There were 16 graduate students enrolled. Enrollment for graduate study in Forestry has not increased, but it is anticipated that when adequate space and facilities are available, enrollment will climb.

Research

A strong emphasis on research, supported by federal, state and private funds, continues in Forestry. The major new development is the shifting of The Belle W. Baruch Research Institute to the College of Forest and Recreation Resources, and approval of the concept of a faculty member in the Department of Forestry as Institute Director resident at Georgetown. He will guide a concerted research effort in forest ecology, including forest wildlife, flora and fauna. A movie produced by Clemson University entitled "The Hobcaw Story" has received national and international recognition and distinction.

Substantial progress was made toward beginning much-needed research programs in the Department of Recreation and Park Administration. Initially this has been done through expanded contract and grants research, but a base of state-funded support should be established by next year. During this year, research or planning studies have been funded by the South Carolina Department of Parks, Recreation and Tourism and the Water Resources Research Institute.

Research in both Departments has been aided by growing cooperation with federal and state government agencies, industry, legislative study groups, and study or planning groups at regional or local levels.
Public Service Activities

The Forestry extension program operates through Cooperative Extension with state support. This group of three foresters continues to make a significant contribution to educating forest landowners in South Carolina to the need for and means of implementing sound forest management practices. Much needed expansion of this extension group is anticipated over the next several years.

The Department of Recreation and Park Administration's various camping and other special programs for the mentally and physically handicapped, underprivileged youth, and the elderly are funded by private groups, other state agencies, and by fees paid by the participants. Camp Hope, Camp Alert, Happy Days Day Camp, Camp Sertoma, College Week for Senior Citizens, and the Senior Citizens Camping Program are providing unique opportunities for these special groups which are not available elsewhere in the state. Some have attracted national attention. A much-needed residential camp facility at Clemson to house these and other special programs seems close to reality, but has not yet been actually funded.

Beyond these programs, both Departments of the College are engaged in a wide variety of public service activities which are not directly funded, but are superposed on teaching and research duties. These include planning and technical advice to state agencies, regional authorities, county, city, town and community groups. Faculty members of both Departments assist legislature study committees, statewide or regional task forces and serve as officers on committees of numerous professional organizations. Through these activities they bring recognition and distinction to Clemson University and to South Carolina.

New Building

All activities in education, research, and public service will be greatly aided and expanded when a new building authorized to house the College of Forest and Recreation Resources is completed. Construction will begin in the fall of 1973. Several forest industries have contributed materials which will add significantly to the appearance of the interior of the building.
Accreditation

The Department of Forestry was re-examined and accreditation was continued by the Society of American Foresters.

COLLEGE OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

The 1972-73 academic year was especially significant for the College of Industrial Management and Textile Science because of several noteworthy achievements and events.

In 1972 this College, which embraces the departments of Industrial Management, Textiles, and Economics, began its second decade of service to South Carolina and the nation under the present organizational structure created in 1962. In that year the existing College division was formed when the University combined the Department of Industrial Management with the School of Textiles, bringing together the applied studies so essential to the economy of South Carolina—economics, management and textiles.

Clemson had foreseen a clear need for textile programs with a greater emphasis on management training. In November 1972 Clemson inaugurated a new interdisciplinary degree, the Ph.D. in Management Science, jointly administered by the Department of Industrial Management and the Department of Mathematical Sciences. The program encourages the enrollment of the superior student who has a demonstrated aptitude for statistical analysis and a primary interest in scientific management research and practice.

During the year the College awarded 214 undergraduate and advanced degrees. Included were 182 bachelor's degrees, 31 masters degrees, and a doctoral degree in Engineering Management.

Programs throughout the College of Industrial Management and Textile Science reflect the basic mission of the College and the University: teaching, research and service for South Carolina citizens and the nation.

Textile Programs

The Color Science Center, directed by Frederick T. Simon, J. E. Sirrine Professor of Textile Science, continues its posi-
tion of leadership in the field. As a service to industry, the Center offered three Professional Development courses attended by 67 students from almost as many industrial plants. The Center also hosted a number of visitors from many parts of the world and advised several firms on color problems.

Because of the demand for students with specialized training in color, an active solicitation campaign—the Color Science Center Research Fund—has been undertaken to provide support for additional graduate students.

Research in the field moved forward with particular emphasis on computer formulation, fluorescence and lighting. A program on lighting was presented at the Carpet and Rug Institute Marketing Forum in Atlanta, and a paper was presented to the Inter-Society Color Council on "Education at the Color Science Center." These appearances, together with participation in technical organizations, have kept the Center's name before the public.

A group led by Dr. Robert H. Barker, J. E. Sirrine Associate Professor of Textile Chemistry, has centered its activities on research and service to the textile industry. Most of the work was aimed at establishing an understanding of the way in which fibers and fabrics burn and how flame retardants operate to inhibit burning.

The results of these studies, which were sponsored by Cotton Incorporated, American Enka Co., and the National Bureau of Standards, have furnished leads which several industrial development teams are using to devise flame retardants for both natural and synthetic fibers.

Dr. Barker's group also plays an active role in collecting, interpreting and disseminating information relating to textile flame retardance from sources throughout the world. As part of this effort, he organized and presented a three-day short course on "Flame Retardance of Fibers," co-sponsored by Clemson and the Plastics Institute of America and a two-day symposium on "Flame Retardation Mechanisms," co-sponsored by the University, the National Bureau of Standards and the National Science Foundation.

Other specific services to industry included special laboratory projects and consulting with a variety of textile fiber and chemical companies, as close cooperation is maintained
with the National Bureau of Standards to assist in their flammability research.

Two seminars were held during the year to acquaint high school guidance counselors and principals with the undergraduate programs available in the College of Industrial Management and Textile Science. The first—held in Greenville—was attended by 42 counselors and principals. The second seminar, held in Columbia, was attended by 35 counselors and principals.

The College also conducted a “Science in Textiles Day” which was co-sponsored by the South Carolina Textile Manufacturers Association. The program brings high school students to Clemson for an insight into the scientific opportunities of textile study.

The year also saw the continuation of the Department of Textile’s Colloquium Lecture Series which represents an integral part of the Department’s Graduate Program; the series features outstanding research and development people—both academic and industrial—who are in the forefront of their particular fields.

Department of Economics

The Department of Economics has a basic commitment to economic education, a commitment seen best in the teaching of undergraduate and graduate students and bringing the discussion of economic issues before the general public.

During the year the Department continued its contribution of providing weekly economics newspaper columns to the Greenville News. In these columns various faculty members discuss timely issues within a framework by which the economics of the problem may be viewed. A development of this series is the recently published “Economics Today,” a collection of 29 columns representing the views of 12 economists of the College of Industrial Management and Textile Science.

Clemson has long realized the value of continuing education. Through the Office of Professional Development, this College is committed to providing opportunities and motivating individuals to grow through meaningful continuing education programs. Last year 1,016 individuals returned to the College of Industrial Management and Textile Science and utilized
its teaching, research and service resources to continue their education.

The debilitating effect which rapid change can have on the well-being of individuals has been a much discussed subject. To cope with this situation, our society is allocating a greater proportion of resources to continuing education than to preparatory education. The ultimate goal of this change in priorities is to shift to the individual the burden of pursuing his own education. In this way, he will be better able to understand and adjust to his environment. The efforts of the Office of Professional Development are directed toward that goal.

One of the important areas covered extensively during the year in Professional Development short courses is occupational safety and health. The College of Industrial Management and Textile Science has established and operates a comprehensive program in this timely field.

During the year, the College offered 10 short courses and workshops dealing with various occupational safety and health topics. These courses were attended by over 400 participants from industry and government.

One of the most important courses was “The Engineering Control of Cotton Dust.” Approximately 110 industrialists and 20 persons from government and education attended this course. The program emphasized the actions which should be taken to control the health hazard of cotton dust during textile manufacturing and the procedures for complying with the Occupational Safety and Health Standards on cotton dust.

Extensive research has been conducted on the health related problems of noise and cotton dust. The research has been directed toward the development of methods of controlling these hazards during textile manufacturing.

Research in the area of noise control has emphasized the control of noise transmission from looms and spinning frames into the supporting floor and to adjacent sections of the building.

Research in the area of cotton dust control has emphasized the development of methods of operation for controlling the amount of dust generated during textile processing and methods for reducing employee exposure to cotton dust.
A model card room and a model comber room have been constructed at Clemson to allow studies of the sources and amounts of dust generated during these operations and methods for controlling this dust.

**COLLEGE OF LIBERAL ARTS**

No university can aspire to be a great university without an excellent program in liberal arts. That is the guiding philosophy of the College of Liberal Arts and the justification for its strong support by the University.

The College of Liberal Arts has a twofold role: to provide required and elective courses for students from all divisions of the University, and to meet the needs of undergraduate and graduate students whose area of specialization is within the College of Liberal Arts. The college comprises six departments: English, Languages, Music, History, Political Science and Sociology, and Psychology. With the exception of the Department of Music, each unit offers an undergraduate major, with the Departments of English and History also offering the master's degree. Qualified graduates from this College have no difficulty entering outstanding graduate, medical, law, and other professional schools.

*Classrooms Without Walls*

The College of Liberal Arts continues its efforts to break down the concept that college education should take place within the confines of the formal classroom, and to place greater emphasis on practical experience. In May and June, 21 students participated in the third "Clemson in England" program, a combination of history courses and related on-the-road learning experiences in historic places and modern English life. In December, 12 students participated in a similar "Clemson in Paris" program, which emphasized French culture, French contemporary theater, and increased knowledge of French language and history.

The Department of Psychology has adopted an innovative approach to its teaching through the use of "personalized student instruction" (PSI) and has introduced two new practicum courses, one in clinical psychology which enables stu-
dents to work with professionals in the mental health field in the Clemson area, and a second course in industrial psychology which exposes students to the methods involved in the selection, training, and motivation of people in actual industries. Because of burgeoning population in the Upstate and a concomitant lack of significant increase in psychology specialists, it may become necessary for the Department to expand some of its offerings into an applied master's degree in community clinical and industrial psychology in the near future.

Both the University family and the general public benefited from another sort of “open classroom” experience with the Public Affairs Forum, sponsored by the Department of Political Science and Sociology, which brought prominent speakers to Clemson to discuss significant public issues, including U. S. Senator Ernest F. Hollings, Governor John C. West, and six other leading state and national public officials.

Leaders In Professional Scholarship

One measure of the quality of a college faculty is the scholarly achievement of its members and the esteem given them by their colleagues at other campuses. In 1972-73 College faculty members obtained the editorship of the “Journal of Political Science,” the professional journal of the South Carolina Political Science Association; and obtained for the period 1973-76 the secretary-treasurership of the Southeastern Conference on Latin American Studies and the editorship and publication of its quarterly newsletter, the “Southeastern Latin Americanist.”

Liberal Arts faculty members were elected president of the South Carolina Historical Association and editor of its “Proceedings.” In addition to hosting a major linguistic conference, the departments continued to gain regional and national attention through their representatives' numerous published books, articles, and reviews, papers presented at national meetings, and participation on national conference panels. One of the most prestigious events of the year and a sign of the increasing excellence of the liberal arts faculty was the establishment of the James W. Lemon Professorship in Literature, which will bring to the campus a nationally known teacher-scholar.
Like all Clemson academic units, the College of Liberal Arts is dedicated to public service activities beyond the more restricted goal of simply educating students. Disavowing the old “town versus gown” attitude, the College of Liberal Arts continues to expand its cultural affairs programs to share a great variety of entertainment/learning experience with the public. Virtually all of the programs—Clemson Players drama troupe productions, guest speakers, music and choral programs, lecture programs like the 12-part “The Future of the American Presidency” series planned for 1973-74—are open to the public at no charge. The University Concert Series, administered by the Department of Music, brought to the Clemson area, at minimal cost to audiences, five programs by some of the world’s most famous musicians and other performing artists.

During the summer Clemson became the first university in the state selected to conduct one of the nation’s very few and highly coveted Robert A. Taft Seminars in Government and Practical Politics, a program that brought 30 secondary school social studies teachers from throughout South Carolina for intensive, face-to-face seminar sessions with Governor John C. West and 18 other public officials, political leaders and experts in the state and the nation’s capital.

The College conducted its second annual “Dionysia Contest,” a special weekend of student drama competition in foreign languages by 13 college casts from schools in South Carolina, North Carolina, and Virginia. The second annual Declamation Contest doubled its participation, from 90 students in 1971-72 to 186 in 1972-73. The response from high schools throughout the Carolinas is a strong indication of their interest in foreign languages, and an indication of the growing influence of this area of the humanities within the College of Liberal Arts.

The College provided a more direct sort of public service through a regional conference on children’s literature for public school teachers, and a state-wide parliamentary procedure workshop for high school students. Regarding the Speech-Drama section of the College, it is noteworthy that the Clemson Forensic Union won first place in the annual Na-
tional Discussion Contest, while Clemson debaters won three national championships at the annual Student Congress, the first time any school has ever won three national championships in the yearly event.

The Future

Public service, high scholarly achievement, and educating responsible citizens remain the guiding principles of the College of Liberal Arts. All indications point to continued growth in the area of the humanities and the social sciences. The humanities will probably remain campus oriented and contribute most significantly in the areas of teaching, personal research, and expanding the cultural affairs goals of the University. Research, teaching, and public service activities of the social science units will be aimed more and more toward finding solutions to problems of poverty, class, race, pollution, rapid urbanization and population growth, public administration, and mental health.

Clemson’s College of Liberal Arts is in no sense encased in the ivory tower. It is a scholar and student community with doors that are always open for an examination of all man’s basic needs and drives—intellectual, emotional, cultural, and social.

COLLEGE OF NURSING

The College of Nursing was established as an integral part of Clemson University with its aim to contribute to the health and welfare of the people of South Carolina through preparation of individuals who will become highly skilled and broadly competent in the practice of professional nursing.

The successful recruitment of faculty with high academic qualifications and clinical nursing expertise gives promise to the continued development of programs of excellence. The expanding student enrollment (434 in August 1973) attests to the relevancy of curricular offerings and to the need for corresponding increase in the number of faculty employed and the concomitant need for additional administrative assistance to the Dean.

The major achievement of the year was accreditation of Associate and Baccalaureate Degree Programs by their re-
spective Boards of Review of the National League for Nursing. Credit for this achievement goes to the faculty of the College for their diligence and perseverance in completing an exhaustive evaluation of their respective programs. Following the submission of the self-evaluation reports to National League for Nursing, five leading nurse educators visited the campus for a week, attended classes and interviewed administrators, other colleges, and visited all facilities. Their reports verifying the self-evaluation reports of the faculty were accepted by the Boards of Review at their meetings in December.

National accreditation in this early phase of the College’s life is indeed a remarkable achievement. The next accreditation visit is scheduled for 1980.

Cooperative Programs

The first students from Central Wesleyan College started their study at Clemson’s College of Nursing during the first summer session of 1973.

South Carolina State College at Orangeburg has approximately ten students enrolled in the pre-Clemson program, and it is anticipated the first students will come to the Clemson campus in May, 1974.

Several Erskine College students also are expected to transfer to Clemson in May, 1974.

Recruitment of Minority Students

On the basis of past experience, the College of Nursing is redesigning its program to recruit the black student and also the disadvantaged student.

Pediatric Nurse Practitioner Program

During the academic year the College offered an introduction to the pediatric nurse practitioner program to a select group of senior students in the Baccalaureate Program. While this was a successful course, and one that would like to be continued, the College has been unable to recruit a faculty member with this expertise. Preparation in this major has been decreasing nationwide, and a truly competitive situation exists in attempts to recruit. The pediatric medical staff at
Greenville Hospital System are interested and will cooperate with the College of Nursing as soon as a pediatric nurse practitioner who has a master's degree in nursing of children is recruited.

**In-Service Project**

The College of Nursing received $17,835 from the Appalachian Regional Commission to support an In-Service Nursing Education Project. A project coordinator was recruited whose nursing education and experiential qualifications give promise to creativeness in this project. In the few months since joining the College, the project coordinator has organized workshops for directors of in-service education of the hospitals and nursing homes in the six-county area, seminars for directors of nursing in the nursing homes in the area, and a series of demonstration programs for the licensed practical nurses. These demonstrations serve a two-fold purpose: provide content for this level of practice, and serve as a guide to in-service education teachers so they can develop similar programs as new staff members are employed in the agency.

**Graduate Education**

The graduate program leading to a Master of Science in Nursing Degree was approved by the Graduate Council and the Educational Council. Further developments in the program must await approval of the Commission on Higher Education. Health agency directors are concerned about the delay in the initiation of this program since the state desperately needs professional nursing leadership. New health delivery models are being developed, but progress is curtailed because of the lack of professional nurses who have clinical expertise and competency in working in collaboration with an interdisciplinary team.

**Associate Degree Program**

Twelve students graduated this year, the majority of whom are working in South Carolina. The ages of the graduates range from 19 to 40. A follow-up of each graduate and employer is done approximately nine to 12 months after graduation. In most cases, the graduates felt they were prepared
to function satisfactorily as beginning practitioners in nursing; however, these new graduates are asked to function as administrators of nursing units, positions for which they are not prepared. This further indicates the need for the graduate program and for demonstrations of staffing patterns which exemplify the employment of nurses whose preparation is appropriate to the role they are expected to assume.

**College of Nursing Building**

Building needs have reached the critical stage with the increased enrollment. The College of Nursing applied for federal assistance and was approved by Health, Education, and Welfare for construction of a College of Nursing building since present facilities are inadequate and the projected student enrollment will be about 575 by 1977. Although the College was assured of priority in funding, the President Nixon's impoundment of approximately $40 million of Health, Education, and Welfare funds has delayed this award.

**Advanced Placement**

Educational opportunities are provided for those who are interested in upward mobility without lowering standards. The University policy of advanced placement and credit by examination has been employed by the College. Registered nurses, licensed practical nurses, and medical corpsmen who are enrolled in the programs have been able to advance through successful achievement on advanced placement examinations.

**COLLEGE OF PHYSICAL, MATHEMATICAL, AND BIOLOGICAL SCIENCES**

The College of Physical, Mathematical, and Biological Sciences has the largest number of undergraduate majors of any college in the University and is responsible for more than one-third of the total teaching duties of the University. In addition to extensive instruction, the seven departments which compose the College are continuously involved in the advancement of research areas, in the formulation and experimentation of new teaching and learning procedures, and in the development and improvement of services to the public.
Biochemistry

The Department of Biochemistry has experienced a tremendous growth with enrollment almost having tripled since its creation on July 1, 1971. The Department operated a Visiting Biochemist Program during the 1972-73 academic year, and 32 institutions of higher learning were visited. The goals of the program are to promote scientific exchange through seminars and discussions, to inform faculty and students about Clemson's biochemistry program, and to act as representatives of Clemson University.

Botany Research

Two research programs supported by the Water Resources Research Institute in the Department of Botany have progressed during the year. In one project the contributions made by rooted and non-rooted vegetation in bodies of water to the productivity of lakes and streams are being studied. The other project concerns an aquatic fungus which is parasitic in mosquito larvae. The fungus attacks and kills larvae in the water, which precludes the mosquitoes from becoming adults and transmitting diseases such as malaria, yellow fever, dengue hemorrhagic fever, and several strains of equine encephalitis. In field work results have been promising from the standpoint of using the fungus for biological control of mosquitoes. Preparations are under way to take the fungus to Indonesia for testing against vectors of dengue in that area of the world.

Chemistry and Geology

The Department of Chemistry and Geology initiated a program that provides greater services to secondary schools and colleges of the area and to nearby chemical industries. High school and college teachers from the Carolinas and Georgia attended a conference on "High School-College Chemistry Interface" to form a basis of mutual interaction and assistance. The Department also began offering certain evening courses for science teachers and industrial chemists.

Mathematical Sciences

The role of the Department of Mathematical Sciences in the computer revolution is noted through the Public Health
Information System that has received wide public recognition. Such an achievement reflects strong interaction between Computer Sciences, Statistics, and Theoretical Mathematics and the benefits provided the State of South Carolina. The increased mathematical competence of Clemson graduates is making significant contributions to industry, textiles, and agriculture. The education system has benefited by major in-service programs in the Piedmont vicinity and the Coastal Plains region.

**Microbiology**

One exciting area of research in the Department of Microbiology has found that in South Carolina lakes and streams thermal pollution, herbicides, and certain chemical wastes disturb the natural balance of microbes, which may adversely affect higher forms of life such as fish. Another research project concluded that industrial pollutants can be lethal to the bacteria presently used as indicators of domestic sewage pollution.

One possibility for new fuel supplies is the biological production of methane gas from waste plant materials. The properties and behavior of microorganisms that produce gas are being studied and information has been obtained that is essential for the construction and operation of a large scale methane generating plant that can operate continuously. The molecular properties of viruses which attack alfalfa are being studied in an attempt to control the disease, and the mechanisms by which bacterial and mammalian cells protect their genes from radiation damage also are under investigation.

**Physics and Astronomy**

The Department of Physics and Astronomy has a large research program involving the properties of superconductors, which might be used to provide more efficient generation and transmission of electrical power over the great distances separating the generating stations and the ultimate users. One faculty member is using the complex techniques of electron paramagnetic resonance in research which could develop greater flame resistance in manmade textile fibers. Another faculty member has discovered that a slight elevation of the
temperature of biological cells makes them extraordinarily sensitive to radiation. This fact has an enormous potential impact in areas such as cancer therapy, mutation rates, genetic stability, and loss of genetic repair associated with the aging process.

A new teaching method, called "Personalized System of Instruction (PSI)," is being used by the Department of Physics and Astronomy as one of its introductory physics courses. It is based on the principle of rewarding learning rather than punishing failure. In this method, course objectives are clearly stated in writing, students study on their own (there are no required lectures), seek help from tutors when necessary, and take quizzes when they feel they are ready. Quizzes are graded immediately after completion in the presence of the student. If students do well on the quizzes, they get immediate reward with the sense of accomplishment and are allowed to advance into the next segment of the program. If they continue to do well they may finish the course early. On the other hand, if students do badly, there are no punishments for they can seek assistance and, having corrected the deficiencies, they can retake the test.

The Department of Physics and Astronomy provides planetarium shows at no charge to public school students and other groups. During the 1972-73 academic year, more than 5,000 public school children attended planetarium lecture demonstrations. In addition, all science departments make their services available to any public school science teacher in the state who wishes assistance in the form of a lecture-demonstration. This presentation can be made in the teacher's classroom, or a scheduled visit of the class to the campus can be arranged so that students can view specific science areas and have an opportunity to talk personally with professional scientists.

Zoology

Members of the Department of Zoology faculty are conducting extensive research to determine the effects of heated water from a nuclear generating plant on the life of aquatic organisms, particularly in aspects of reproduction and number of species of invertebrates and fish. One faculty member is
investigating the role of certain proteins in controlling the transport of genetic information. The research on migratory habits of birds is continuing in an attempt to reduce damage to jet engines and airplane crashes due to bird-aircraft collisions. This project is sponsored by the U. S. Air Force.

Student Science Training Program

Under the sponsorship of the National Science Foundation, high school students from throughout the nation and a number of students from areas outside the U. S. attended the Student Science Training Program during a six-weeks summer period. These students attended lectures, worked in labs, and investigated various biological problems, many of which were original work in the field. At the end of the program each student made an oral presentation and a written report of the work accomplished.

THE GRADUATE SCHOOL

During the first semester of the 1972-73 academic year 21 per cent of the total student body was enrolled in the Graduate School. In addition, 30 per cent of these graduate students attended their classes through off campus programs such as the Clemson-Furman MBA program and the numerous in-service institutes for elementary and secondary school teachers offered by the College of Education. Several colleges have initiated evening programs offering graduate courses for engineers and other professionals employed by industries in the Piedmont area. Under a new policy formulated by the Graduate Council, professional graduate degree requirements may be completed entirely on a part time basis utilizing courses taught off campus by Clemson University faculty as well as the evening courses.

A record graduate student enrollment of 2,252 registered during the spring semester. Although on campus enrollment was nearly the same as the fall semester, off campus enrollment increased by one-third more than the preceding semester.

Several new graduate programs were reviewed by the Graduate Council and prepared for submission to the South Carolina Commission on Higher Education. The University
was notified by the Commission that approval had been granted to initiate a Ph.D. program in Biochemistry effective January 1, 1973.

Approximately 15 per cent of the on campus graduate students were enrolled in Ph.D. programs; 212 students during the fall semester, 225 the spring semester. The number of Ph.D. students enrolled has remained stable during the past two years at Clemson in spite of the adverse national publicity regarding Ph.D. surpluses in certain fields.

During 1972-73 the Graduate Council revised and formulated several policies regarding transfer credits, the grade of incomplete for graduate courses, thesis format requirements, and duplication of masters degrees. An in-depth study of the Ph.D. language requirements was initiated as well as a survey of faculty opinion regarding the importance and usefulness of a language requirement for the Ph.D. degree.

A total of 487 masters degrees in 40 majors were awarded during the 1973 fiscal year, as well as 45 Ph.D. degrees in 18 different specialties. Nine Ph.D. and five masters programs did not award degrees during the past year. At the request of the Commission on Higher Education, the University is reviewing several of its graduate programs which have awarded only a few degrees during the past six years. It is planned that subsequent to these reviews all remaining graduate programs will be examined during the next two or three years.

ROBERT MULDROW COOPER LIBRARY

The Library added 27,252 new volumes to its collection during 1972-73, increasing the total library holdings to 507,645 volumes. In addition, the Library has 51,989 reels of microfilm and 139,647 units of microfiche.

To supplement its collection the Library borrowed 1,742 items from other libraries on interlibrary loans. Of these 1,128 were borrowed by the Science, Technology and Agriculture Division for faculty and graduate students. Since Clemson offers doctoral degrees in 26 disciplines, the relatively small number of items borrowed from other libraries reflects the careful work of selection that has been carried on consistently for many years. In response to requests, this library
loaned 702 items to libraries and industrial plants in 32 states and four foreign countries—Canada, England, India and Mexico.

The importance to scholars of the special collections is emphasized by the fact that researchers came from California and Kansas to use the resources. Thirty-nine persons from 14 states, Canada and West Germany consulted the collection in the Library. In addition, nine persons requested information by mail. A total of 2,124 Xerox copies of manuscripts were provided for these researchers.

Orientation instruction for freshman and advanced students is offered to better acquaint them with the use of the Library. This consists of 50 minutes of class instruction followed by a one-hour library assignment. During the year, 118 classes received this instruction. A 15 minute slide-tape presentation, “An Introduction to the Library,” has been very useful in the orientation program.

Two immediate goals of the Library are to provide additional shelving by double-decking stacks on the second floor (Phase II of the planned library expansion), and to continue to increase the collections to meet the minimum goal of 800,000 volumes.

The very careful self-study that was made prior to the visit of a committee from the Southern Association resulted in several recommendations which were endorsed by the Visiting Committee of the Association. Good progress has been made in implementing the recommendations.

**UNIVERSITY COMMUNICATIONS CENTER**

Supporting the University's activities in teaching, research and public service, the University Communications Center is a centralized service department. It is equipped and staffed to meet the University’s needs in television, radio, photography and visual aids.

Television activities include the production of video tapes for the Cooperative Extension Service, the South Carolina Agricultural Experiment Station and the academic departments. Some of the television programs are distributed on a regular basis to commercial and educational television sta-
tions throughout the state. Other video tapes are utilized in classrooms and laboratories as an additional resource to teaching faculty. Short television features are prepared by Communications Center staff members for use by commercial television stations in their news programs.

This year the University expanded its activities with the South Carolina Educational Radio Network. Each weekday morning faculty members are featured in instructional radio programs broadcast to all public school classrooms capable of receiving signals from the state's two powerful educational radio transmitters. Radio programs designed primarily for adult listeners are broadcast in afternoon and evening programming. In addition to educational radio, the University continues to serve commercial radio stations with short feature programs and news reports.

Consistently, departments request more of photographic services than any other area of the Center. Production of still pictures, slides and motion pictures continues to increase significantly each year. The availability of low cost, high quality photographic services and the willingness of staff members to spend the time and effort necessary to produce what faculty members want is resulting in wider utilization of these services than ever before.

In the visual aids section, Communications Center artists prepare exhibits for state and county fairs, art work for television programs, motion pictures, slides and overhead transparencies.

In addition to direct services, Communications Center staff members advise teaching, research and extension faculty on effective ways to utilize photographic and electronic media. The increasing interest in innovative approaches to communicating effectively with students and public predict the University Communications Center will continue to expand and improve its services in the future.

**COMPUTER CENTER**

In September, 1972 the Computer Center's IBM System 360, Model 50 was replaced by a System 370, Model 155. The higher performance of the new computer was essential to the satisfaction of two major needs: rapid turnaround for small stu-
dent jobs, and extension of data processing services to locations outside the Center.

The first of these needs has been met through installation of a fast batch input-output station in the Center. This station provides immediate turnaround for several thousand jobs each week.

Our joint effort with the Public Health Department is one example of continuing progress in the development of interactive facilities to meet the second need. Immediate access is provided to the health care records of people served by the department in two counties, facilitating treatment and providing an overall health profile for the area.

In addition, installation of a number of remote job entry devices throughout the Clemson campus has provided more effective computing services to both academic and administrative users.
STUDENTS

Academic year 1972-73 was a year in which student achievements thrust Clemson University into national and regional limelight and a year in which several strikingly effective programs were geared up for the benefit of the Clemson student body. It also was a year in which, again, enrollment and academic statistics and on-campus activities demonstrated clearly that an institution of Clemson's size and character—an institution founded on warm person-to-person relationships—can provide any student with a superior, relevant college education without sacrificing that environment of cultural, intellectual and demographic diversity so essential to create enlightened citizens in a complex modern society.

Most obviously, it was a year of excellence in student achievement.

A 1972 Clemson graduate won the prestigious Hughes Trophy Award, presented by the U. S. Army to the most outstanding Army ROTC commissioned graduate in the nation. There were 10,572 other Army ROTC cadets commissioned nationwide in 1972.

Clemson became the first school in history to win three national champion honors in the annual "Student Congress" sponsored by the country's oldest national society for intercollegiate debaters. Forensic Union members also took first prize in the annual National Contest in Public Discussion.

The University's Pi Kappa Alpha fraternity was named the nation's most outstanding chapter from among the organization's 160 collegiate chapters in the United States and Canada. More locally, "The Tiger" student newspaper won the first place award of excellence in the category of largest schools in the S. C. Collegiate Press Association, as well as first place in interpretive news and reporting—despite the fact that Clemson has no journalism major.

In 1972-73 the University formally established its Student Union, an organization to plan and coordinate for the student body a variety of cultural and entertainment events, short courses, travel programs, the Student Volunteer Services program (community service) and the campus "Hotline" (telephone crisis intervention service). While the Student Union was established, construction was begun on a University
Union complex, and major renovation continued on related facilities like Fike Recreation Center—all part of a multi-phase master building program designed to help meet the recreational, extracurricular and leisure time needs of a 10,000-member student body and the general University family.

In January 1973 the first 19 students went to work in Clemson's new Cooperative Education Program, a five-year program that enables a student to combine periods of on-campus study with periods of full-time employment experiences related to his major field of study. Clemson was also one of only 157 colleges and universities selected to participate in GRAD II, a computer-assisted program to match students with prospective employers. And a third employment service, for summer job referral, was established by the newly formed Student Alumni Council, a student group which helps coordinate relations between the Alumni Association and students.

Academic excellence continued to characterize the Clemson student body. Some 91 per cent of Clemson's entering freshmen in 1972 were graduated in the upper half of their high school class with 30 per cent graduating in the top 10 per cent of their class. Two hundred and twenty students, or about 23 per cent of the graduating class, were cited for high scholastic achievement at May 1973 Commencement exercises. That occasion also saw Clemson award its first professional Master of Forestry degree and its first Master of Fine Arts Degree (in painting).

Total enrollment was up more than 3.6 per cent in the 1973 fall semester when a record 10,112 students registered for classes, despite Clemson's phasing out of its off-campus undergraduate centers at Greenville and Sumter. The main campus enrollment of 9,461 in 1973 represented a 10.2 per cent increase over the previous year, while graduate enrollment (2,202) was up almost 6.3 per cent.
Fall semester enrollment comparisons for recent years are shown below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Graduate</th>
<th>Undergraduate</th>
<th>and Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968-69</td>
<td>6,165</td>
<td>674</td>
<td></td>
<td>6,839</td>
</tr>
<tr>
<td>1969-70</td>
<td>6,203</td>
<td>818</td>
<td></td>
<td>7,021</td>
</tr>
<tr>
<td>1970-71</td>
<td>6,679</td>
<td>1,359</td>
<td></td>
<td>8,038</td>
</tr>
<tr>
<td>1971-72</td>
<td>7,300</td>
<td>1,590</td>
<td></td>
<td>8,890</td>
</tr>
<tr>
<td>1972-73</td>
<td>7,686</td>
<td>2,071</td>
<td></td>
<td>9,757</td>
</tr>
<tr>
<td>1973-74</td>
<td>7,910</td>
<td>2,202</td>
<td></td>
<td>10,112</td>
</tr>
</tbody>
</table>

The 1973-74 figures include 515 students attending off-campus institutes and 136 students in the Clemson-Furman University Master of Business Administration degree program.

Clemson students come from all 46 South Carolina counties, 45 states, Puerto Rico and the District of Columbia, and 37 foreign countries (127 students). The Admissions Office processed 4,992 applications and more than 13,000 College Board scores for 1973-74. Out of 3,793 students accepted for admission, 65 per cent actually enrolled. In early May the University was unable to accept further freshman applications.

Enrollment of women reached an all-time high during the 1973 fall semester with 3,575, of which 2,591 were undergraduates on the main campus. Enrollment of undergraduate coeds on the main campus increased about 21 per cent over last year. Women students now constitute 34 per cent of on-campus enrollment and about 35 per cent of total enrollment, reflecting a rapid growth trend which now appears to be stabilizing.

The increase in new student men (freshmen and transfer students) is significant. In recent years most of the growth in undergraduate enrollment has resulted from growth in the number of coeds. This year the number of new men increased by 170 compared with a decline of 92 in the fall of 1972. New women have increased by only 48 compared with 130 in 1972, but the availability of coed housing was a definite factor in this restricted growth.

The Clemson student body continues to be a working student body which also receives significant loan, scholarship and other financial assistance. In 1972-73 approximately 2,300-
students (excluding graduate assistants) earned $1,730,000, a figure which does not include substantial earnings of students engaged in off-campus employment or of participants in the College Work Study Program. The University awarded several hundred long term loans and 149 scholarships and grants (exclusive of athletic grants-in-aid and donor-selected scholarships) with a value of more than $100,000. In all, a total of almost one-third of Clemson's students received financial assistance. The total Clemson students received from scholarships, grants, athletic grants-in-aid, veterans, social security and rehabilitation benefits, and student employment on-campus is estimated at more than $4.5-million during 1972-73 (not included are loans, student employment off-campus and donor-selected awards).

Additional tabular information about the Clemson University student body is given below:

**FALL SEMESTER 1973 ENROLLMENT**

**BY COLLEGES, AND DEGREES AWARDED DEC. 1972-AUG. 1973**

<table>
<thead>
<tr>
<th>Main Campus Enrollment Fall Semester</th>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Associate</td>
</tr>
<tr>
<td>Agricultural Sciences</td>
<td>466</td>
</tr>
<tr>
<td>Architecture</td>
<td>455</td>
</tr>
<tr>
<td>Education</td>
<td>1,250</td>
</tr>
<tr>
<td>Engineering</td>
<td>1,011</td>
</tr>
<tr>
<td>Forest and Recreation Resources</td>
<td>658</td>
</tr>
<tr>
<td>Ind. Mgt. and Textile Science</td>
<td>1,278</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>1,088</td>
</tr>
<tr>
<td>Nursing</td>
<td>407</td>
</tr>
<tr>
<td>Phys., Math. and Bio. Sciences</td>
<td>1,297</td>
</tr>
<tr>
<td>Graduate Studies and Others</td>
<td>1,529</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>9,461</td>
</tr>
</tbody>
</table>

Degrees awarded since 1896 total 28,018 of which 130 have been associate degrees; 24,852 bachelor's degrees; 2,734 master's degrees; and 302 doctorates.
Number and Per Cent of Students from South Carolina and from Out-of-State (Main Campus)

<table>
<thead>
<tr>
<th>Year</th>
<th>S.C.</th>
<th>Per Cent</th>
<th>Out-of-State</th>
<th>Per Cent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>2,416</td>
<td>78</td>
<td>677</td>
<td>22</td>
<td>3,093</td>
</tr>
<tr>
<td>1960</td>
<td>3,231</td>
<td>80</td>
<td>817</td>
<td>20</td>
<td>4,048</td>
</tr>
<tr>
<td>1965</td>
<td>3,494</td>
<td>70</td>
<td>1,530</td>
<td>30</td>
<td>5,024</td>
</tr>
<tr>
<td>1966</td>
<td>3,867</td>
<td>70</td>
<td>1,673</td>
<td>30</td>
<td>5,540</td>
</tr>
<tr>
<td>1967</td>
<td>4,201</td>
<td>69</td>
<td>1,856</td>
<td>31</td>
<td>6,057</td>
</tr>
<tr>
<td>1968</td>
<td>4,604</td>
<td>71</td>
<td>1,921</td>
<td>29</td>
<td>6,525</td>
</tr>
<tr>
<td>1969</td>
<td>4,799</td>
<td>72</td>
<td>1,867</td>
<td>28</td>
<td>6,666</td>
</tr>
<tr>
<td>1970</td>
<td>5,219</td>
<td>73</td>
<td>1,969</td>
<td>27</td>
<td>7,188</td>
</tr>
<tr>
<td>1971</td>
<td>5,968</td>
<td>75</td>
<td>1,997</td>
<td>25</td>
<td>7,965</td>
</tr>
<tr>
<td>1972</td>
<td>7,170</td>
<td>83</td>
<td>1,414</td>
<td>17</td>
<td>8,584</td>
</tr>
<tr>
<td>1973</td>
<td>7,469</td>
<td>79</td>
<td>1,992</td>
<td>21</td>
<td>9,461</td>
</tr>
</tbody>
</table>

NUMBER AND PER CENT OF BLACK STUDENTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>179</td>
<td>2</td>
</tr>
<tr>
<td>1973</td>
<td>211</td>
<td>2</td>
</tr>
</tbody>
</table>

NUMBER OF STUDENTS IN SUMMER SCHOOL

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>948</td>
</tr>
<tr>
<td>1960</td>
<td>1,015</td>
</tr>
<tr>
<td>1965</td>
<td>3,216</td>
</tr>
<tr>
<td>1966</td>
<td>3,539</td>
</tr>
<tr>
<td>1967</td>
<td>3,980</td>
</tr>
<tr>
<td>1968</td>
<td>4,820</td>
</tr>
<tr>
<td>1969</td>
<td>4,472</td>
</tr>
<tr>
<td>1970</td>
<td>4,428</td>
</tr>
<tr>
<td>1971</td>
<td>4,692</td>
</tr>
<tr>
<td>1972</td>
<td>5,232</td>
</tr>
<tr>
<td>1973</td>
<td>6,267</td>
</tr>
</tbody>
</table>

STUDENT-FACULTY RATIO

(Full-Time Equivalent)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>12.6 : 1</td>
</tr>
<tr>
<td>1970</td>
<td>13.1 : 1</td>
</tr>
<tr>
<td>1971</td>
<td>14.6 : 1</td>
</tr>
<tr>
<td>1972</td>
<td>14.6 : 1</td>
</tr>
<tr>
<td>1973</td>
<td>16.8 : 1</td>
</tr>
</tbody>
</table>
### AVERAGE COLLEGE BOARD SCORE OF FRESHMEN

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>998</td>
</tr>
<tr>
<td>1965</td>
<td>1003</td>
</tr>
<tr>
<td>1966</td>
<td>995</td>
</tr>
<tr>
<td>1967</td>
<td>1005</td>
</tr>
<tr>
<td>1968</td>
<td>1005</td>
</tr>
<tr>
<td>1969</td>
<td>1015</td>
</tr>
<tr>
<td>1970</td>
<td>1005</td>
</tr>
<tr>
<td>1971</td>
<td>997</td>
</tr>
<tr>
<td>1972</td>
<td>995</td>
</tr>
<tr>
<td>1973</td>
<td>982</td>
</tr>
</tbody>
</table>

### NUMBER OF DORM ROOMS AND PER CENT BEING UTILIZED

<table>
<thead>
<tr>
<th>Year</th>
<th>Rooms</th>
<th>Per Cent Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>2,900</td>
<td>100</td>
</tr>
<tr>
<td>1965</td>
<td>3,624</td>
<td>97</td>
</tr>
<tr>
<td>1966</td>
<td>3,920</td>
<td>99</td>
</tr>
<tr>
<td>1967</td>
<td>4,348</td>
<td>97</td>
</tr>
<tr>
<td>1968</td>
<td>4,780</td>
<td>95</td>
</tr>
<tr>
<td>1969</td>
<td>4,764</td>
<td>94</td>
</tr>
<tr>
<td>1970</td>
<td>5,190</td>
<td>93</td>
</tr>
<tr>
<td>1971</td>
<td>5,174</td>
<td>97</td>
</tr>
<tr>
<td>1972</td>
<td>5,174</td>
<td>100</td>
</tr>
<tr>
<td>1973</td>
<td>5,330</td>
<td>102</td>
</tr>
</tbody>
</table>

### NUMBER OF TEACHERS
(Full-Time Equivalent Teaching Faculty)

<table>
<thead>
<tr>
<th>Year</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>571.2</td>
</tr>
<tr>
<td>1971</td>
<td>580.1</td>
</tr>
<tr>
<td>1972</td>
<td>614.8</td>
</tr>
<tr>
<td>1973</td>
<td>578.4</td>
</tr>
</tbody>
</table>
NUMBER IN FRESHMAN CLASS
(New Students)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>640</td>
</tr>
<tr>
<td>1960</td>
<td>1,363</td>
</tr>
<tr>
<td>1965</td>
<td>1,479</td>
</tr>
<tr>
<td>1966</td>
<td>1,388</td>
</tr>
<tr>
<td>1967</td>
<td>1,559</td>
</tr>
<tr>
<td>1968</td>
<td>1,632</td>
</tr>
<tr>
<td>1969</td>
<td>1,468</td>
</tr>
<tr>
<td>1970</td>
<td>1,774</td>
</tr>
<tr>
<td>1971</td>
<td>1,853</td>
</tr>
<tr>
<td>1972</td>
<td>1,919</td>
</tr>
<tr>
<td>1973</td>
<td>2,034</td>
</tr>
</tbody>
</table>

ACCEPTANCE RATE OF APPLICANTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>79%</td>
</tr>
<tr>
<td>1968</td>
<td>79</td>
</tr>
<tr>
<td>1969</td>
<td>79</td>
</tr>
<tr>
<td>1970</td>
<td>87</td>
</tr>
<tr>
<td>1971</td>
<td>87</td>
</tr>
<tr>
<td>1972</td>
<td>83</td>
</tr>
<tr>
<td>1973</td>
<td>83</td>
</tr>
</tbody>
</table>

RETENTION RATE OF STUDENTS
(Freshman Class)

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>77%</td>
</tr>
<tr>
<td>1966</td>
<td>79</td>
</tr>
<tr>
<td>1967</td>
<td>76</td>
</tr>
<tr>
<td>1968</td>
<td>80</td>
</tr>
<tr>
<td>1969</td>
<td>82</td>
</tr>
<tr>
<td>1970</td>
<td>78</td>
</tr>
<tr>
<td>1971</td>
<td>84</td>
</tr>
<tr>
<td>1972</td>
<td>82</td>
</tr>
</tbody>
</table>
## 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>$2,133,337</td>
<td>6.6%</td>
</tr>
<tr>
<td>State Appropriations</td>
<td>16,113,433</td>
<td>49.9%</td>
</tr>
<tr>
<td>Federal Appropriation (Morrill-Nelson)</td>
<td>111,944</td>
<td>.3%</td>
</tr>
<tr>
<td>Student Fees</td>
<td>3,351,641</td>
<td>10.4%</td>
</tr>
<tr>
<td>Gifts/Grants</td>
<td>335,119</td>
<td>1.0%</td>
</tr>
<tr>
<td>Research Grants &amp; Contracts, Institutes and Training Grants</td>
<td>1,706,103</td>
<td>5.3%</td>
</tr>
<tr>
<td>Auxiliary Enterprises and Related Activities</td>
<td>7,421,983</td>
<td>23.0%</td>
</tr>
<tr>
<td>Sales, Services and Miscellaneous Income</td>
<td>1,049,192</td>
<td>3.2%</td>
</tr>
<tr>
<td>Transferred from Other Funds</td>
<td>89,802</td>
<td>.3%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$32,312,564</strong></td>
<td>100.0%</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>$12,054,326</td>
<td>40.0%</td>
</tr>
<tr>
<td>Organized Activities Related to Educational Departments</td>
<td>61,714</td>
<td>.2%</td>
</tr>
<tr>
<td>Sponsored Research</td>
<td>796,495</td>
<td>2.7%</td>
</tr>
<tr>
<td>Other Separately Budgeted Research (Excluding Agricultural Experiment Station)</td>
<td>297,098</td>
<td>1.0%</td>
</tr>
<tr>
<td>Other Sponsored Programs</td>
<td>732,164</td>
<td>2.4%</td>
</tr>
<tr>
<td>Libraries</td>
<td>943,639</td>
<td>3.1%</td>
</tr>
<tr>
<td>Student Services</td>
<td>1,631,266</td>
<td>5.4%</td>
</tr>
<tr>
<td>Physical Plant Operation and Maintenance</td>
<td>3,604,555</td>
<td>12.0%</td>
</tr>
<tr>
<td>Administration &amp; General Expense</td>
<td>2,755,225</td>
<td>9.1%</td>
</tr>
<tr>
<td>Auxiliary Enterprises &amp; Related Activities</td>
<td>7,243,509</td>
<td>24.1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$30,119,991</strong></td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Funds for Encumbrances, Deferred Income and Restricted Funds Balance

<table>
<thead>
<tr>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,192,573</td>
<td></td>
</tr>
</tbody>
</table>

**GRAND TOTAL**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$32,312,564</strong></td>
<td></td>
</tr>
</tbody>
</table>
### AGRICULTURAL RESEARCH, AGRICULTURAL EXTENSION & OTHER PUBLIC SERVICE ACTIVITIES

#### WHERE THE MONEY CAME FROM

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encumbrances, Deferred Income &amp; Restricted Funds Balance</td>
<td>$316,328</td>
<td>1.9%</td>
</tr>
<tr>
<td>State Appropriations</td>
<td>$7,936,029</td>
<td>47.9%</td>
</tr>
<tr>
<td>Federal Appropriations</td>
<td>$6,248,867</td>
<td>37.7%</td>
</tr>
<tr>
<td>Sale of Farm &amp; Forest Products</td>
<td>$746,652</td>
<td>4.5%</td>
</tr>
<tr>
<td>Grants and Contracts</td>
<td>$1,093,518</td>
<td>6.6%</td>
</tr>
<tr>
<td>Other Sales and Services</td>
<td>$242,198</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$16,583,592</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

#### HOW THE MONEY WAS USED

<table>
<thead>
<tr>
<th>Service</th>
<th>Amount</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Research</td>
<td>$6,061,891</td>
<td>37.5%</td>
</tr>
<tr>
<td>Agricultural Extension Service</td>
<td>$7,879,947</td>
<td>48.8%</td>
</tr>
<tr>
<td>Livestock–Poultry Health Service</td>
<td>$1,503,449</td>
<td>9.3%</td>
</tr>
<tr>
<td>Fertilizer Inspection &amp; Analysis</td>
<td>$173,355</td>
<td>1.1%</td>
</tr>
<tr>
<td>Plant Pests Regulatory &amp; Disease Eradication Services</td>
<td>$330,620</td>
<td>2.1%</td>
</tr>
<tr>
<td>Other Public Services</td>
<td>$196,693</td>
<td>1.2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$16,145,955</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Funds for Encumbrances, Deferred Income and Restricted Funds Balance | $437,637

**GRAND TOTAL** | **$16,583,592**

### STUDENT AID 1

#### WHERE THE MONEY CAME FROM

<table>
<thead>
<tr>
<th>Source</th>
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<tbody>
<tr>
<td>Loan and Interest Payments</td>
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<td>Gifts/Grants for Scholarships, Fellowships, Other Stipends</td>
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<td>Investment Income</td>
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<td><strong>TOTAL</strong></td>
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</table>

#### HOW THE MONEY WAS USED

<table>
<thead>
<tr>
<th>Source</th>
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</thead>
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<tr>
<td>Educational Loans</td>
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</tr>
<tr>
<td>Grants for Scholarships, Fellowships and Special Purpose Stipends (Including Grants-In-Aid)</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$909,966</strong></td>
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</tbody>
</table>

1 Does not include student financing through United Student Aid Funds, Inc., commercial educational lending agencies, or scholarships/grants not administered by the University. Funds received and expended for graduate assistantships are reflected in "Educational and General."
South Carolina was founded upon its agricultural potential. As a provider of food, fiber and shelter, agriculture continues to be the state’s most basic industry. Progress in agriculture supports and stimulates growth and development of other industries.

Agricultural research in the state has a long history, dating to 1669 when the Lords Proprietors provided a test garden of 10 acres on the Ashley River near Charleston. The South Carolina Agricultural Experiment Station was established by the state in 1889 under Federal laws; Morrill Act of 1862, Hatch Act of 1887, and subsequent Acts. The agency operates under state control with annual state appropriations supplemented with annual Federal appropriations.

Today, the Station is charged with conducting basic and applied research in agriculture and related sciences for the benefit of all segments of society. Its programs encompass interdisciplinary and interagency research in 11 departments at six Experiment Stations and at Winthrop College.

Branch Experiment Stations located away from Clemson conduct research that has relevance to the entire state, but they are particularly useful in solving problems common to their own geographic and climatic areas. In the latter sense, the Simpson Station near Pendleton pinpoints problems common to the Piedmont; the Edisto Station serves the Savannah Valley area; and the Pee Dee Station emphasizes research on crops of the middle and lower Coastal Plains. The Sandhill, Coast and Truck Stations conduct research on special problems peculiar to the area in which they are located. Home Economics research is conducted on a cooperative basis with the staff at Winthrop College.
HIGHLIGHTS AND ACCOMPLISHMENTS

The brief, highlighted summary of research that follows reflects only a small portion of the program of the South Carolina Agricultural Experiment Station during the period of July 1, 1972 to June 30, 1973.

**Agricultural Economics and Rural Sociology:** Increased production of food and fiber is a basic requirement for economic growth and development. In the development process agricultural economists and rural sociologists are concerned with formulating policies, programs and procedures for guiding development efforts in directions that will create a better life for South Carolinians.

Problems of primary concern to researchers are developing and implementing programs and activities in environmental quality, labor and mechanization, capital requirements, marketing, management, water supply, agricultural chemicals and pest control, and low income. The need for agricultural leadership is increasing rapidly as the farms and agricultural industries reorganize to keep pace with our changing society.

To meet future needs of agriculture in South Carolina, continued research is needed to enable the wise use of our land, forests and water resources. Population increases and competition for land between urban and other non-agricultural users make it difficult to produce more food, fiber and timber on reduced land resources, and by smaller numbers of farm people.

**Agricultural Engineering:** Through engineering research, Clemson is making significant contributions to improved efficiency in production and processing of food and fiber and in conservation and use of water resources.

Among new harvesting and handling systems developed by agricultural engineers is a peach harvester, patented by the University. Other research developments included mechanical equipment for harvesting tomatoes and cucumbers and a once-over, low-profile tobacco harvester developed by engineers at the Pee Dee Experiment Station. Progress continues on the development of okra harvesting equipment.

Culminating several years of research, a new concept in herbicide incorporation and planting of cotton was field tested
at the Pee Dee Station. Research on cotton modules for storage was conducted on a statewide scale.

Conservation and utilization of natural resources continue to be essential for increased food production and preservation of ecological values. Further development of ground water resources in the Coastal Plains and hydrologic research on Piedmont watersheds add to the body of knowledge needed to best utilize natural resources. Innovative approaches to complete soil-water management in bottomland and coastal plain soils are being studied to discover new methods of drainage during periods of excess rainfall and moisture retention for periods of drought.

Agricultural waste management systems are being developed. Research in this field is now contributing to improved practices as well as helping agriculture meet required government regulations for maintaining a clean environment.

**Agronomy and Soils:** Ways are being sought by Experiment Station agronomists and soil scientists to increase the amount of food and fiber produced on South Carolina farms. Attempts are being made to find superior varieties of cotton, soybeans, small grain, corn, tobacco and forages by plant breeding techniques. Progress is being made in breeding disease and insect resistance into high yielding and adapted lines to reduce the need for pest control by chemicals. Rust resistance is being incorporated in small grain and corn breeding lines. Encouraging progress is being made in incorporating Mexican bean beetle resistance in soybeans. New species and varieties of winter perennial forage grasses are being sought for the upper Coastal Plain of South Carolina.

Better cultural practices are being researched to increase yields of soybeans and cotton. Better weed control systems for the state's agronomic crops are being developed to help eliminate competition of weeds for moisture and plant nutrients and reduce the pesticide load on the land. New herbicide chemicals are being evaluated and give promise of controlling some of the most difficult weeds such as cocklebur and Johnson grass. Minimum and no-tillage practices for sorghum, corn and soybeans are being investigated as ways to minimize erosion and conserve labor, organic matter and moisture.

Agronomists also are involved in studies designed to help
find ways to preserve and maintain the quality of soil resources. Soils throughout the state are being examined for their inherent characteristics to determine their best potential land use and capability for deactivating wastes.

Animal Science: Producing quality beef and pork acceptable to the consumer in the most efficient way possible is the objective of research under way by Clemson animal scientists. The success of their efforts to meet the spiraling demand for red meat will largely determine the availability and price of meat in the future.

Crossbreeding experiments to produce heavier calves at weaning, increasing the percentage of calves weaned, and increasing conception rates are among the tools researchers are using to improve the efficiency of the state's beef and pork industry. New methods of artificial breeding of cattle using proven sires have been used to increase the gaining ability of the calves and produce leaner animals. Since South Carolina is deficient in grain production, corn silage is utilized to its maximum in cattle fattening rations.

The desirability of producing unsaturated fat for human diets has prompted research in feeding swine a ration that includes cooked soybeans. Other studies with swine involve the effect of nutrition and management on the number of pigs born and weaned.

Dairy Science: Experiment Station dairy scientists have been working to improve the quality of the milk supply for consumers and to develop more efficient management practices for producers. Their research has involved studies of various factors affecting milk flavor quality and production efficiency, including evaluations of different dairy rations.

Environmental quality also is a concern of Clemson dairy researchers. The pollution of streams by nearby dairy farms has received major research attention. Of the streams studied, a significant number exceeded state water quality standards; however, in most cases dairy operations were not indicated as the major pollution source.

Efforts are under way to improve reproductive efficiency in South Carolina dairy herds by more careful management of dairy animals.
Entomology and Economic Zoology: Entomologists at Clemson are working to develop more effective ways for sampling and estimating populations of pecan insects. This effort should provide pecan growers with simplified sampling procedures that will help them determine when chemical treatments are necessary.

Various studies involving Leucocytozoon disease in turkeys are under way by entomologists. Their results will enable turkey growers to more effectively control this serious disease problem and to further expand the industry, which is estimated at $13,000,000 per year in South Carolina.

A biological control effort for reducing populations of houseflies breeding in poultry manure is in the experimental stage. Two species of parasites are being laboratory-raised and released to assess their impact on housefly populations. Insect species that feed on manure are also being used in experiments that determine the amount of manure consumed and the resulting quantity and quality of protein produced.

Chemical testing for updating control recommendations for fruits, vegetables and other crops continues. Research into a systems management approach to insect control using combinations of chemical and biological insecticides at very low rates continues to show promising results.

Food Science: Significant research progress has been made in the past year by food scientists at Clemson. A process for converting raw peanuts into a highly adaptable precooked flake has been developed and patented. The process provides a completely new concept for utilizing peanuts in a diversity of food products, i.e., an extender for meat and poultry products, meat analogs, meat and cheese-flavored sandwich spreads and dips, and in confections.

Research also has resulted in the development of promising lines of opaque-2 corn of higher protein quality than normal corn. This development offers an excellent means to improve the nutritional quality of popular corn based snack foods and should contribute significantly to improved rations for animal and poultry feeding.

Other studies involved finding new possibilities for utilizing such agricultural products as deboned turkey and chicken...
meat, soybeans, cottonseed and dry skim milk in the production of various processed food products.

*Home Economics:* Six new or continuing projects highlighted the home economics related research conducted by the South Carolina Agricultural Experiment Station at Winthrop College.

In the area of Family and Child Development, a study of influences affecting the occupational goals of young people from low-income groups in the South was completed. In addition, Family Education Day Care is in its third year of operation. This project, which provides field experience for Winthrop students in related professional programs has 150 pre-school children in day care programs.

Two consumer-related projects are in progress in the textiles area. A program evaluating carpet test methods and their relation to consumer acceptance continues. A new project on the acceptability and performance of flame-retardant children's nightgowns involved 160 children who tested winter garments. A similar test involved summer nightwear.

Food and nutrition research pinpointed factors affecting the breakfast consumption habits of college students. Another project deals with food intake and nutritional health of nine to twelve-year-old girls. A larger study in this area is now under way.

*Horticulture:* Although horticultural research at Clemson involves fruits, vegetables, ornamentals and processing of fruits and vegetables, the major research effort is devoted to peaches.

There are some 20 peach related projects under way by Experiment Station scientists covering the spectrum of activities required to produce high quality fruit. These projects include: breeding; rootstock and variety evaluation; cultural practices such as tree density, soil management, nutrition, pruning and herbicides; the effects of plant growth regulators on thinning, maturation and ripening; postharvest physiology and thinning; and the peach tree short life problem.

Peach tree short life research has shown promising results in the past year. Horticultural scientists in cooperation with
plant pathologists have developed a list of suggested grower practices which hopefully will reduce tree losses.

The primary effort in vegetable research was directed toward developing new varieties of vegetables and improving practices of chemical weed control. Horticulturists have been working to develop new vegetable varieties with characteristics that make them more adaptable to mechanical harvesting.

*Plant Pathology and Physiology:* Plant pathologists have been involved in research projects in cooperation with other departments within the College of Agricultural Sciences. This interdisciplinary research effort is seeking to solve many of the diverse problems related to agricultural production in South Carolina.

Cooperative studies with the mechanical harvesting of peaches have shown considerable success in controlling post-harvest decay of mechanically harvested fruit. Control was achieved by spraying a wax or fungicide onto the fruit as it moved up the conveyor belt of the harvester.

Host range studies of the distribution pattern of the Columbia lance nematode have been greatly expanded. Through research, temporary control of the pest on cotton and soybeans has been achieved by a combination of chemical and cultural practices.

Pathologists have been actively conducting field and laboratory research on the peach tree short life problem throughout South Carolina and in North Carolina and Georgia to find solutions to this costly threat to the state's peach industry. A ten-point program has been developed and released to peach growers to reduce premature tree deaths.

*Poultry Science:* Research in poultry science has involved turkeys, commercial layers, broilers and game birds in that order of priority. The great potential for further growth in turkey production has emphasized a need for solutions to breeding problems and for control measures for fowl cholera and Leucocytozoon disease.

Hatch project 971 "Transmission, Pathology and Control of Leucocytozoon Disease in Turkeys" received major effort from several members of the Poultry Science Department and involved cooperation with the Entomology and Economic Zo-
ology Department, the Livestock-Poultry Health Department and several commercial turkey growers.

Poultry scientists involved with commercial layer research are concerned with changing housing systems with attention to different lighting regimens. This research has included studies of egg shell quality and possible means of reducing egg breakage.

Basic research on nutrition-disease relationships was conducted with broiler chicks. Results of this research may help explain some of the growth depression seen under commercial poultry conditions and prove helpful in understanding digestive tract diseases of man.

**FUNDS FOR THE EXPERIMENT STATION OTHER THAN THOSE FROM FEDERAL SOURCES**

*Classification of Expenditures and Receipts for 1972-73*

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<th>Agricultural Research</th>
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<td>Expenditures 3,459,202</td>
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<td>Receipts from State Treasurer 3,459,202</td>
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<td>(Regular Appropriation)</td>
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<td>Operating Revenue Receipts 643,063</td>
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<td>Unexpended Balance Brought Forward from Previous Year 118,624</td>
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<td>Balance Forward $262,552</td>
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FEDERAL FUNDS
THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION—1972-73

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Expenditures $1,211,040 $247,121
Receipts for the Year from the Treasurer of the United States $1,211,040 $247,121

ACTIVE RESEARCH PROJECTS 1972-73

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Economic and Sociological Aspects of Comprehensive Land-Use Planning in South Carolina.
Optimizing the South Carolina Community Hospital System for Improving Access by Rural Residents.
Appraising Farmer Needs, Attitudes and Participants in Selected Cooperatives in South Carolina.
Improving Market Facilities.
Cotton Quality Survey.
Evaluation of the Beef Production Industry in the South.
The Demand for Environmental Quality: Theory and Measurement.
Contract Marketing of Cotton.

Systems Analysis of the Vegetable Subsector of the Food Industry of the South.

Develop and Operate an Information Filter Center to Aid in Marketing.

An Economic Analysis of the Adjustments in Rural Human Resources as New Technology is Adapted in Agriculture.

Egg Marketing Systems for the South.

Variations in Value of Agricultural Land in Cotton-Producing Areas.

The Economic and Social Effects of Farm Resource Transfers Out of the Dairy Industry in South Carolina.

Providing Basic Agricultural Marketing Information for Program and Facility Planning.


Economic Evaluation of Alternative Forms of Vertical Coordination in the Livestock-Meat Industry.

Analysis of Demographic Data for the Human Resources of South Carolina.

Development of Human Resource Potentials of Rural Youth in the South and Their Patterns of Mobility.

A Study of Factors Affecting Costs of Marketing Cotton in South Carolina.

Predicted Effects of Selected Policy and Technology Changes in the Grain Marketing System.

Social Impact of Economic and Population Changes in Transitional South Carolina Counties.

An Analysis of Rural Development in the Southeastern United States.

A Farm-Oriented Economic Appraisal of Potential Technological and Institutional Changes in South Carolina Agriculture.

Market and Production Potential for South Carolina Ornamental Crops.

Effects of Selected Changes in the Real Property Tax System on Agricultural Land Use and Tax Revenues in South Carolina.
Feasibility of Marketing Cooperatives in the South Carolina Seafood Industry.
A Study of Demand and Utilization of Cotton by Textiles Mills.
Economic Analysis of the Opportunities to Develop Rural Tidelands Industries through Improved Financial Management.

AGRICULTURAL ENGINEERING

Dynamic Modeling of Weed Control Cotton Production.
Hydrology of Piedmont Agricultural Watersheds.
Development of Anaerobic Processes for Agricultural Waste Treatment.
Dairy Farm Waste-Management Characterization and Disposal.
Engineering Systems for Cotton Production.
Factors in Drainage Evaluation and Design.
Mechanical Okra Harvesting.
Factors Affecting Water Yields from Shallow Ground Aquifers.
Critical Placement of Pesticides in the Seedbed.
Mechanizing the Production of Vegetables.
Farm and Gin Community Evaluations of Machinery Complements for Harvesting and Hauling Seed Cotton.
System Analysis for the Production of Quality Cottonseed.
Methods and Equipment for Optimum Herbicide Placement.
Physical Properties of Fruits and Vegetables Relating to Automatic Sorting.
Root Zone Water Management Systems.
Waste Disposal from Food Processing Plants in South Carolina.
Physical Properties and Quality of Fruits and Vegetables.
Soil Water Management Decision Making.
Physical, Social and Economic Aspects of Functional Housing for Low Income Families in the Southern Region.
Quality Losses During Storage of Baled Coastal Bermudagrass Hay.
Rate of Seed Moisture Availability and Seed Soil Contact.
Engineering Systems for Cotton Production.
Summer-Annual-Grass Variety Trials.
Surfactant’s Influence on Herbicides’ Effectiveness.
Improvement of Flue-Cured Tobacco by Development of More Adequate Fertilization and Cropping Systems.
Cytology of Trifolium Species in the Section Amoria (Ascher-son and Graebner).
Minimum Tillage and No Tillage in Production of Corn and Soybeans.
Evaluation of the Micronutrient Status of Soils and Plant Response to Added Micronutrients.
Breeding Fiber Quality in Cotton.
Pedological Studies in South Carolina.
Nutrient Availability and Subsoil Compaction.
Evaluation of Grain Sorghum Hybrids and Advanced Breeding Lines.
Interaction of Representative Pesticides on Cecil or Norfolk Soils.
Small Grain Breeding.
Soybean Breeding.
Variables Influencing Sward of Clovergrass Pastures.
Evaluation of Corn Hybrids and Advanced Breeding Lines.
Permanent Pastures, with and without Topseeded Species, for Production of Beef.
Forage Sorghum Varieties for Silage.
Orchardgrass Improvement.
Adaptation of Perennial Forage Grass Species.
Cotton Breeding.
Evaluation of Cotton Varieties and Advanced Experimental Strains.
Evaluation of Selected Grain Sorghum Hybrids.
Diagnosis and Correction of Zinc Problems in Corn and Rice Production.
Fertilizers and Organic Wastes Applied to Soils in Relation to Environmental Quality.
Development of Weed Control Practices in Corn, Cotton and Soybeans.
Entrance of Lead Into Food Chain From Soil.
South Carolina Soybean Yields as Influenced by Row Spacing.
Growing Cool-Season Pasture Species in Association with Coastal Bermudagrass.
Soil Behavior Under Different Levels of Management and Use.
Short Season Cotton Production as Affected by Variety Row Spacing, Nitrogen Rate and Harvest Method.
Evaluation of Soybean Varieties and Advanced Experimental Strains.
Herbicide Movement from Application Sites and Effects on Nontarget Species.
Evaluation of New Fertilizers as Sources of Plant Nutrients for South Carolina Crops.
Trends in Sulfur Supply of Air, Rainwater and Soil Types as Related to Agronomic and Horticultural Crop Needs for Sulfur as a Plant Nutrient in South Carolina.
Orchardgrass Improvement.
Adaption and Breeding of Cool-Season Forage Grass Species.

ANIMAL SCIENCE
Selection for Reproductive Efficiency and Weaning Performance in Beef Cattle.
Diets for Artificially Reared Pigs.
Corn Silage with Urea and Other Additives Plus High and Low Moisture Grain in Beef Cattle Dry Lot Finishing Systems.
Influence of Exogenous Progestins on Fertilization of Bovine Female.
Response of Sire Progenies to Management and Feeding Procedures.
Corn Silage, Urea and Corn for Finishing Beef Cattle in Dry-lot.
Protein Studies with Cecal-fistulated Ponies.
Litter Size as Affected by Nutrition and Exogenous Hormones.
Control of the Time of Estrus and Parturition on the Bovine using Prostaglandin F\textsubscript{2\alpha} Protein in Level Sequences for Pigs Fed to Heavier Weights.
Litter Size as Affected by Nutrition and Management of Brood Sow.
Cooked Soybeans in Diets for Growing-Finishing Swine.
Factors Responsible for Tenderness Variation in Meat.
Wintering Cows on Synthetic and Natural Protein Supplements.
Protein and Energy Studies with Early Weaned Pigs.
Polyunsaturated Pork Products for the Consumer.
Ration Alternatives Using Cooked Soybeans for Growing-Finishing Swine.

**DAIRY SCIENCE**
Blue Cheese Manufacture as a Means of Utilizing Milk Produced in South Carolina.
Practical Aspects of Urea Utilization by Ruminant Animals.
Sex Steroids and Their Relationships to Fertility in The Bovine Female.
Management Factors and Decisions that are Different Between High and Low Producing Dairy Herds as Related to Udder Health.
Accuracy of Milk Production Estimates by the Use of the AM-PM Method.
Innovative Materials Handling for Packaging and Distributing Milk.
Waste Disposal in the Dairy Industry and Stream Pollution.
Improving Reproductive Efficiency in South Carolina Dairy Herds.
Role of Methionine and Sulfur in Rations Containing Urea When Fed to Ruminants.
Flavor Quality and Milk Consumption.

DHIA Laboratory (service).

Ensiled Complete Rations for Lactating Cattle.

The Role of Antibiotic Therapy in the Production of Normal Milk.

**EXPERIMENT STATISTICS**

Development and Maintenance of a Statistical Analysis System.

**ENTOMOLOGY**

Biology and Control of Insects Affecting Forests.

Biology and Control of Blackflies Transmitting *Leucocytozoon*.

Catfish Breeding, Production and Marketing.

Studies on Trichostrongyloidosis in Ruminants.

Biology and Control of Insect Pests of Legumes and Forage Crops.

Waste Disposal.

Transmission and Vector Biology of *Leucocytozoon smithi* in Turkeys.

Insecticide Residues in Plant and Animal Products.

Epidemiological and Biological Studies of *Leucocytozoon smithi* in Turkeys.

Bionomics and Control of the Pecan Weevil.

Insect Pest Management.

Effects of Tranquilizing Agents on Insects.

Biology and Control of the Plum Curculio Attacking Peach Trees.

Biology and Control of Insects Attacking Ornamental Plants.

Tobacco Insect Investigations.

Biology and Control of Insects Affecting Man and Animals.

Identification and Distribution of Insects of Economic Importance to South Carolina.

Biology and Control of Peach Tree Borers.

Control of Vegetable Insects in the Piedmont of South Carolina.

Biology and Management of Arthropods Attacking Pecans.
Effect of Infection by *Eimeria spp.* upon Intestinal Absorption of Carbohydrates in Chicks.

Biology and Control of Arthropods on Apples.

External Parasites of Poultry, their Biology, Distribution and Control.

Wildlife Management Research.

Pond Culture of Warm-Water Fish.

Insects on Corn and Miscellaneous Field Crops.

Biology and Control of White Peach Scale and Cat-Facing Insects Attacking Peach Trees.

Boll Weevil Investigations.

Analysis of Effects of Weather and Environment on Insects.

Bionomics, Parasites and Predators of Nantucket Pine Tip Moth.

**FOOD SCIENCE**

Methods for Increasing Utilization of Peanuts.

Utilization of Dietary Fat from Various Sources.

Broiler Carcass Character and Processing Quality.

Salt-Free, Biodegradable Solutions for Storage of Pickling Cucumbers.

Amino Acid Composition of Protein Quality of Corn.

Quality of Bound Poultry and Red Meat Products.

Effect of Light Quality on Detached Fruits.

Growth of Light Quality on Detached Fruits.

Growth of and Toxin Production of *Clostridium perfringens* in Food.

Methods of Increasing the Utilization of Poultry.

Nutritional Aberrations and Ethanol, and Behavior of Offspring in Rats.

Effect of Ripening and Microbial Infection on Pectic Substances of Fresh Fruit.

**HOME ECONOMICS**

Survey of the Breakfast Consumption Habits of College Students.

Comparison of Consumer and Laboratory Evaluation of Carpets.
Influences on Occupational Goals of Young People.
Food Intake and Nutritional Status of Preschool Children.
Patterns of Food Intake and Nutritional Health of Girls.
Investigation of Consumer Acceptance of Flame Retardant Infant's Sleepwear.

HORTICULTURE

Herbicides, Their Influence on Physiology of Vegetables.
Sweet Potato Breeding.
Post-Harvest Treatments, Environmental Factors on Shelf-Life, Market Quality of Peaches.
Processing Fruits and Vegetables.
Evaluation and Improvement of Flowering Plants with Relation to Variety and Productive Techniques.
Cultural and Management Practices for Peaches and Small Fruit.
Evaluation of Vegetable Varieties and Cultural Practices Associated with Production in the Coastal Plains Region of South Carolina.
Relationship of Fruit Characteristics and Quality to Location and Environmental Factors.
Cultural Management of Centipede Grass Turf.
Therapeutic, Physical, Psychological and Rehabilitated Responses to Certain Aspects of Horticulture.
Handling, Packaging, Transportation and Storage of Peaches.
The Use of Chemical Preservatives in Extending the Vase Life of Cut Snapdragons.
Physiological Study of Plant Growth Regulators on Woody Ornamental Plants.
Detection and Evaluation of Plant Growth-Environment Relationships.
Identification of Behavior of Anthocyanin Pigments in Peaches for Processing.
Growth, Yield, Fruit Quality of Pears, Commercial Cultural Practices.

Development, Production, Management of Turf-Grasses.

Apple Production.

Peach Breeding.

Breeding Edible Southern Peas.

New or Special Crops.

Breeding Bunch Grapes for the Southeast.

Studies on Vegetable Culture.

Mineral Nutrition of Peaches and Grapes.

Growth Regulators in Peach Production.

Nutrition, Management, Horticultural Crops and Varieties.

Evaluation, Improvement, Horticultural Crops and Varieties.

Lawn Grasses, Fruits for the Coastal Area.

Development of Plum Varieties for Coastal Plains.

Evaluation of Fruit Varieties and Rootstocks.

Improving Cultural and Management Practices for Tree and Small Fruits.

Disease Resistant Cantaloupe Varieties.

Plant Growth Regulators on Physiological Changes.

Effect of Seaweed Extract and Seaweed Meal on the Quality, Shelf-Life and Yield of Peaches.

**PLANT PATHOLOGY AND PHYSIOLOGY**

Bacterial Canker Disease of Peach.

Cause and Control of Diseases of Shade and Ornamental Trees.

The Causes and Control of Diseases of Cereal Grains in South Carolina.

Seed and Seedling Diseases of Cotton and Their Control.

Integrated Plant Disease Control and Farming Systems with Field and Vegetable Crops.

Diseases of Soybeans and Their Control.

Diseases of Forest Trees.

Bacteriophage Ecology in the Bovine Rumen.
Diseases of Ornamental Shrubs and Flowers of South Carolina.

Disease Control on Vegetables.
Pesticides for the Control of Fruit Diseases in South Carolina.
Investigation of the Mechanism of Herbicidal Action.
White Clover Pathology, Virus and Other Diseases.
Biological Determination of Performance for Planting Seed.
*Hoplolaimus columbus* (lance nematode)—Population Management, Crop Damage and Control.
Tobacco Pathology.

**POULTRY SCIENCE**

Transmission, Pathology and Control of Leucocytozoon Disease in Turkeys.

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Efficiency of Producing Chicken Hatching Eggs via Artificial Insemination and Natural Mating.

Development of Low Cholesterol Eggs.

Fowl Cholera: Biological Therapy, Blood Serum Electrolytes, Relation to Leucocytozoon Infection.

Quail Bronchitis Virus Infection.

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Effect of Noise Pollution on the Fowl.

Zinc Metabolism in Poultry.

Biology and Control of Poultry Coccidia Using *In Vitro* Method.

Intestinal Parasitism and Nutrient Absorption in Poultry.

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Recycling of Turkey Litter into Ruminant Diets.

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EDISTO EXPERIMENT STATION
Development of Resistance in Soybeans to Insects.
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Comparison of Cross Breeding Systems for Improving Beef Production.
A Comparison of Corn and Sorghum Silage for the Production of Beef in the Coastal Plains.
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The Cooperative Extension Service conducts statewide programs in continuing education in 16 disciplines relating to agriculture, home economics, youth and community development, and educational information under a Memorandum of Understanding between Clemson University and the United States Department of Agriculture.

Objectives of the Service are closely related to those of the federal enabling legislation, the Smith-Lever Act, which assigns it the mission of disseminating useful and practical information to all citizens on matters within its assigned areas of responsibility. The Act provides for cooperation of federal, state and county governments in planning, financing and conducting programs.

The Cooperative Extension Service is intensively involved in national and state efforts to help people improve their skills, earning capacity, nutrition and health, and to attain the educational, personal and social attributes that will help them raise their standards of living.

The Service conducts active educational programs for the producers of all crop and livestock commodities of economic importance; carries out programs in marketing and utilization; and directs a wide variety of programs ranging from home economics to community and resource development. In carrying out its missions, the Service attempts to achieve maximum coordination with all county, state, and federal agencies.

Implementation of the Service’s programs are carried out under six broad program areas; agricultural programs, 4-H, home economics, community and resource development, special programs, and 1890 programs.

**Extension Agricultural Programs**

*Broad Scope of Activity:* Extension agricultural specialists and county personnel provide educational and advisory services to the state’s agriculture and agribusiness sectors on a day-to-day basis from county, regional and state offices.
To meet constant demands for information to support the state's agriculture, Extension conducts active and continuing programs in economics, agronomy, animal science, dairy science, forestry, horticulture, poultry science, agricultural engineering, insect and disease management and marketing.

Extension specialists also are undertaking roles that have wider impact. For instance, the implementation of standards for environmental waste by state and federal agencies has placed a heavier burden upon personnel as farmers seek guidance in bringing their operations under compliance. Extension also is assisting state and federal regulatory agencies in establishing criteria for standards.

A basic role of Extension Agricultural Programs is to foster a dynamic and productive agriculture that will have maximum impact upon the state's economy. Following are highlights of the 1972 effort:

—South Carolina's cash receipts from farm marketings exceeded a half-billion dollars for the first time during 1972. Farm marketings amounted to more than $559 million and must be considered a significant milestone of agricultural progress.

In the previous years 1970-1971 total farm income exceeded a half-billion, but only after farm marketings and government payments were added. The 1972 total farm income—including government payments—totals $609 million. Net farm incomes for the year were also at record levels.

—Beginning with the early winter of 1972 most livestock producers encountered a period of steeply rising feed costs resulting from increasing grain exports, dollar devaluations and bad weather that hampered planting and harvesting of grains. In many cases producers were unable to pass their increasing costs on to consumers in time to recoup their losses. Extension personnel immediately went to work to assist producers in continuing production and minimizing their losses. Increased hay, grain, and forage production were recommended where feasible to reduce the volume of purchased feed inputs.

Dairymen were advised to substitute lower cost feed ingredients for soybean meal and corn. One dairy specialist alone wrote "prescription" type least cost ration formulas for some
50 dairymen and sent similar information to other dairymen on a weekly basis. Agricultural engineers, economists and agronomists held grain harvesting and storage schools to stress the importance of harvesting and preserving all the state's feed grain production. The Director of Extension appointed a special committee to assess the feed situation on a continuing basis. As a result of the short feed supply and high prices, Extension agronomists and entomologists are attempting to re-establish alfalfa more extensively on livestock farms in the state.

—This was the year in which South Carolina's agriculture turned the corner in international trade. Total value of overseas exports of agricultural commodities came to $173.6 million, up $39 million from last year. To give intelligent direction to agricultural expansion within the state, agricultural economists have computed and disseminated enterprise budgets for all major crops to assist producers in deciding what crops to plant for maximum profit. Agricultural economists are increasing their efforts to help farmers in all phases of planning, including meetings and seminars to teach better tax management and estate planning. Forward planning is becoming more critical as farmers handle larger sums of money.

—Extension poultry scientists became deeply involved in informing the state's poultry producers of the character and threat of Exotic Newcastle Disease. This disease, a new and more virulent strain of an existing disease, endangers the entire poultry industry. In order to bring all producers up to date on the status of the disease in the U. S., Extension poultry specialists arranged and conducted a state-wide informational meeting, held other meetings and short courses, disseminated information by direct mail to producers, and made use of mass media outlets. Recommendations for preventing the introduction of the disease into the state include the use of vaccinations, extreme care in importing birds and recommending regulations to prevent the importation of pet birds from foreign countries.

—The safety of large numbers of small farmers and farm workers was jeopardized following the banning of DDT and the substitution of materials more toxic to the human body. Extension conducted Project Safeguard in nine counties to
acquaint these citizens and medical personnel with the hazards and treatment of organophosphorus poisoning. Because this generally is a hard-to-reach group, it was decided that person-to-person contact with individuals would be the most efficient way to communicate messages of insecticide safety. It was first estimated there were 3,700 farms in the nine counties, but after checking with ASCS offices, it was determined that some 6,500 contacts would have to be made to assure that all those in danger of exposure would be reached. Extension workers attempted 6,541 contacts and completed 3,870. Also contacted were 191 doctors and hospitals, 214 pesticide dealers and formulators. During the campaign, Extension workers conducted or wrote 141 news articles for television, radio and newspapers within the area.

—In 1972 Extension accepted the responsibility of implementing a three-year cotton pest management program aimed at developing a system that would protect the crop and reduce environmental contamination; protect growers from possible hazards from DDT substitute insecticides; collect data for predicting potential pest outbreaks; and promote grower acceptance of the pest management concept.

Supporting funds were derived from USDA, APHIS, FES, Clemson University and participating growers.

Calhoun County was selected as the site for a program that would include all phases of the pest management concept and include cultural, biological, and chemical controls of the more important cotton pests. Twenty-three other counties participated in supervised cotton scouting programs but were not a part of the pilot project.

Emphasis during the initial year was devoted to introducing Calhoun County growers to supervised scouting. They were urged to base all insecticide applications on economic thresholds as determined by weekly scouting reports. This phase was highly successful. Growers making 9-10 applications made yields equal to growers making 25-27 applications.

A major emphasis centered around allowing native beneficial insects to control early season pests such as aphids, spider mites and first generation bollworms. This practice was successfully demonstrated.

Follow-up practices include late season insecticide applica-
tions to control diapausing boll weevils, pre-season trapping of boll weevils with sex lure traps, use of systemic insecticides to control emerging over-wintered boll weevils, light traps to monitor bollworm moth flights, and ovicides to kill bollworm eggs are planned for the 1973-74 season.

All experiences and results obtained in this pilot project will aid the implementation of a proposed boll weevil eradication program scheduled for South Carolina in the late 1970's.

**Four-H and Youth Development**

*Broad Scope of Activity:* Four-H is the youth phase of the Cooperative Extension Service's work.

It's conducted by Extension personnel in the 46 counties through organized clubs in connection with school and community activities, and supplemented by special interest groups.

Enrollment in South Carolina reached an all-time record of 79,470 youths in 1972-73.

Included were 60,290 in regular 4-H clubs, 5,472 in special interest groups, and 13,708 through the youth phase of Extension's Expanded Food and Nutrition Program.

Continued efforts are made to broaden 4-H to reach a greater number of youth from nine to 19 with a modern, flexible program that will meet their interests and needs. Activities are planned for all youth, rural or urban, black or white, regardless of income.

Because of the shifting of population from farm to more rural non-farm and urban areas in recent years, rapid change has occurred in general living patterns and the 4-H programs. They have been brought "uptown" to serve everyone. While traditional programs are maintained, innovative activities also are receiving new direction to meet the interests of today's young population. New emphasis is given on innovative areas such as bicycle, aerospace, small engines, fashions for boys and girls, horse clubs, and veterinary science.

A closer look has been taken at the overall county programs, and 4-H units or clubs have been organized in areas not previously served by Extension. Larger 4-H clubs have been divided into smaller groups in order to give more individual attention to disadvantaged members.
County Extension staffs have outlined a positive action plan including long-term goals. All counties selected one or more of the National purpose 4-H youth development goals. These embrace:

A. Having youth acquire knowledge and practical skills in science and technology.

B. Improving the nutritional level of the human diet through work with youth from low-income families in 4-H type educational programs.

C. Stimulating personal growth and development, both physical and behavioral.

D. Encouraging participating youth to acquire breadth and depth of understanding, developing personal attitudes toward self and others most likely to lead toward responsible citizenship.

All counties also have implemented procedures to enlist additional volunteer leadership for the 4-H program. Some 1,317 adult volunteer leaders and 452 teen leaders are assisting with these programs. Extensive in-service training sessions are conducted for professional Extension workers as well as volunteer leaders taking part in 4-H.

Camping Programs

The State 4-H Camping Program is an increasingly important factor in the overall youth program. It is a potent force for informal education. It is a good way to develop character and one of the best ways to teach citizenship. Increased emphasis is being placed in this program area.

The regular 4-H county camp program is well balanced, with educational, inspirational and recreational activities.

Educational activities include citizenship, health, safety, electricity, forestry and other subject matter programs. Inspirational ceremonies include flag raising, retreat, vespers, and candlelighting programs. Recreational activities include softball, volleyball, shuffleboard, crafts, horse shoes and swimming. Campers have the opportunity of choosing their recreational activities.

An effort is made to maintain a balance between recreational and educational training with emphasis on the development of leadership among the 4-H members.
During the 1973 regular summer 4-H camping season, 2,027 4-H members attended Camp Bob Cooper and Camp Long.

In addition to these, 474 youth attended special interest camps in the following areas: Conservation, Dairy, Electric, Youth Business and Horse. The objective of these special interest camps was to teach specific subject matter material and present information to the youth which could not be done on a local level. The second Teen Leader Retreat was held at Camp Long and had as its objective to provide opportunities for teens learning new ways of serving as leaders in their home communities.

**Horse Program**

The State 4-H Horse Program is one of the fastest growing Extension youth activities. Enrollment has reached an all-time high of 3,387.

An active State 4-H Horse Committee plans, coordinates and supervises the program.

Events during the year included a statewide horse judging contest and a statewide 4-H horse show at the State Fairgrounds in Columbia. The year was climaxed with two weeks of horse camp at Camp Bob Cooper in Summerton with some 149 campers attending.

**Other Accomplishments**

Among other highlights of Extension’s 4-H year:

—An annual State Conference on Clemson University’s campus attracted 600 top youths for four days of training, recreation and awards presentation.

—More than 100 gathered at Camp Long for the second Teen Leader Retreat, three days of sharing ideas on new ways of serving as leaders in their communities. A number of senior citizens were special guests; a delegation representing deaf people told through an interpreter how 4-H’ers might help in their silent world; and a state legislator helped span the generation gap by telling the youths ways in which they can get involved in the world of politics around them.

—Twenty-four 4-H teens, one volunteer leader, and two county Extension workers participated in South Carolina's
first statewide delegation to a Citizenship Short Course conducted by the National 4-H Club Foundation in Washington, D. C.

Home Economics

Broad Scope of Activity: The Extension home economics program is varied in subject matter and clientele, covering a demanding and diversified front of homemaking activities from the rural home to the urban setting.

It's an area that affects all levels of South Carolina residents; the affluent and disadvantaged alike can use guidance in some phase of home economics, although the area of emphasis may differ.

Program areas include clothing and textiles, child development and family relations, foods and nutrition, health and safety, home furnishings, home management, and housing. Through Extension homemaker clubs and councils in the counties, community action projects such as cultural arts, citizenship, and beautification are carried out.

Programs are conducted by county Extension personnel, often with guidance and backup services from the specialists staff at Clemson.

Extension home economists also cooperate with other state agencies and organizations that have related objectives. Extension assumed leadership in 1973 in the reorganization of the state nutrition committee which has representatives from institutions, agencies, and industry to coordinate efforts in nutrition research and education. Each county has a similar committee.

Expanded Food and Nutrition Education Program

The Expanded Food and Nutrition Education Program continued to make an impact on the nutritional status and food practices of low-income urban and rural families in 30 counties of South Carolina.

Families participate in the program from one to four years, depending on the level of knowledge and practices when they enter the program and the rate of progress made.

A total of 17,497 participated during the year, with 10,856
families enrolled in June 1973. In addition, 8,701 non-program families were reached through home visits or group meetings.

These families are reached through working home visits and small group meetings through the efforts of Extension nutrition program assistants who live in the communities in which they work.

Their major objective is to assist families in improving their food practices and nutritional status. Program assistants encourage many other changes in the lives and practices of these families. They motivate improvements in homes and surroundings, to seek employment, or to take training for employment. Another by-product is often an improved relationship between members of the family.

Program assistants are supervised by a County Extension Home Economist who provides basic in-service training and regular training and counseling. Members of Clemson's state home economics staff develop subject matter materials and provide in-service training guidance to the county home economists.

Another phase of the program involves the youth of program families, as well as youth of other families in the areas. Youth groups are conducted by volunteers who are trained and supervised by a home economist. The groups have bi-weekly or monthly meetings in which lessons on basic nutrition, meal planning, food preparation and food buying are taught.

Some group members had community plots for vegetable gardens or plots at their homes. These were most successful activities. Mini-camps and special tours were conducted during the summer months. During the fiscal year, 14,987 youth participated, 10,398 of them new to the program. Some of the 1,087 volunteers who work with youth groups are program homemakers who have made progress or graduated from the program.

It is through their daughters that homemakers are often motivated to make changes or to participate in the program.

Vegetables and fruits and milk products are the two food groups most frequently lacking in the low-income family's meals. After being enrolled in the program, experience has shown the use of milk products increases most readily, and
after about two to three years, both milk and fruits and vegetables are served on a fairly regular basis even though they may not reach recommended standards every day. Families with sufficient incomes to purchase recommended amounts of meats readily make this change if they are not already doing so. They need guidance in making selections for the money spent.

The Expanded Food and Nutrition Education Program families who have records of continuous illnesses show definite improvements in health and sanitation after being enrolled in the program. Improved health for some families is often the major factor in securing or changing employment which will provide more adequate incomes.

Clothing

Clothing programs have centered around family concerns for getting better quality for the clothing dollar.

Between July 1972 and June 1973, 19 counties conducted one or two clinics and workshops for youth and adults on pattern selection as part of a consumer-oriented program to show how to get a good fitting pattern. This program encouraged more people to sew, instructing them how to select patterns suitable to their figures to eliminate or minimize alterations.

Special interest classes on sewing knits, men's wear, pants and other clothing for all family members have been held to help South Carolinians take advantage of the wide variety of fabrics available. Forty-three counties provided programs on clothing construction through demonstrations and workshops.

In family-oriented educational fashion shows, emphasis was placed on how to identify quality, performance and easy care from tags and labels, and how to choose fashion. Parents heard and read about the new flame-retardant nightwear required by law in children's nightwear through radio, newspaper and exhibits.

Four-H clothing programs dealt with fashion and how to use it to the best advantage in clothing selection.

All county staffs, through radio and newspaper, emphasized
timely consumer information on buying family clothes as well as how to treat the new fabrics to keep them wearable and thus stretch their clothing dollars.

**Consumer Education**

Consumer education has always been a part of the Extension home economics program, but in recent years especially in 1972-73, increased consumer interest has intensified efforts. Extension staff members from agricultural economics and marketing worked with members of the home economics staff in preparing a monthly newsletter for county staff members on "CONSUMERS WANT TO KNOW . . ." Major efforts in 1972-73 have been directed toward food buying. Material from the newsletter was used for county newsletters, radio and television programs, news articles and group lessons. County extension home economists received in-service training in food buying in 1972 that helped them meet the needs for educational programs. Emphasis was on shopping to get the best nutrition and save money.

Young couples were encouraged to participate in special sessions on financial management, insurance, credit and investments.

**Housing**

Home economists in the three Pilot Housing Project counties reached families this year through special meetings.

Individual sessions and a series of meetings were held to discuss topics ranging from "Termite Control" and "Kitchen Planning" to "Vacation and Recreation Facilities." Audiences included consumers, builders and developers.

A series of lessons on home ownership, maintenance and care were conducted for families in the lower income levels. These were held in homes or apartments financed by Farmers Home Administration or HUD 235. Owners of the homes, their friends and neighbors attended the lessons. Care of appliances, budgeting and care of floors were three of the topics discussed.

One home economist, in addition to teaching lessons on home ownership, maintenance and care to low-income families, counseled 10 families and assisted them in filling out
applications for FmHA loans. She counseled an additional 30 families, and then directed them to the FmHA office to make loan applications.

Audiences reached by the special interest meetings ranged from teenagers to senior citizens.

**Community and Resource Development**

*Broad Scope of Activity*: The main thrust of the Extension Community and Resource Development Program (CRD) was the delineation and organization of the program.

Unlike other Extension Programs, CRD has not been well defined or understood. This has been a nationwide problem. In 1972-73 a special effort was made to create better understanding.

Community development can generally be defined as improving the level and quality of living in communities. Similarly, rural development can be defined as improving the level and quality of living in rural areas.

Unfortunately, neither of these definitions really distinguishes the type of program in the CRD efforts in Agriculture, Home Economics and the Youth programs. What has been needed in the program is not simply a general definition but one that distinguishes the program area from the more traditional program areas in the Extension Service.

After considering the current program efforts in South Carolina and the rest of the nation, some definitions were developed to delineate the Extension CRD effort in this state.

The Extension Service has focused its CRD program primarily on the following areas of common concern that require the collective efforts of people residing in communities:

- local government
- education and training
- crime prevention & law enforcement
- employment opportunities
- housing
- land-use planning & zoning
- solid waste disposal systems
- water & sewer systems
- fire protection
- health services
- transportation
- recreation
- welfare
- environmental protection
- community organization
- community relations
- beautification
- historical preservation
More technical information and assistance is needed in all 18 areas. With limited Extension personnel available to provide technical information and assistance, priorities within the 18 types of community improvement had to be determined.

Areas in which Extension CRD specialists concentrated were land-use planning, zoning, recreation, rural fire protection, solid waste management and water systems. Efforts to improve technical information and assistance to communities in other types of community improvement will be made as quickly as professional manpower is provided. As technical information is generated, it is transmitted to counties through newsletters, regular publications such as "Palmetto Economics," and other publications.

To achieve collective success for a particular community improvement, people need organization, information, technical assistance, general agreement and funds. Through educational efforts the Extension Service can assist local people in obtaining each of these.

County Meetings

Extension CRD specialists and the State Program Leader completed eight district meetings in the state in which the program definition and program responsibilities of the Extension Service were reviewed with county extension leaders and associate leaders. County Extension personnel were given an opportunity to describe problems and difficulties that they have with the Extension CRD program. Since those meetings, the main effort has been to identify and organize local leadership that can help conduct a responsible community improvement program. Initiating strong county programs to involve a large number of non-professional leaders in the improving of community facilities and services will continue to be a major focus of the program in 1973-74.

Local Assistance

The Cooperative Extension Service has an agreement with the Governor's Beautification and Community Improvement Board to provide for the organization and technical support of county committees that participate in the Governor's program.
Counties have other committees including a separate Extension CRD committee and numbers of action committees on particular community improvement projects such as rural fire protection, water systems, solid waste disposal, recreation and housing.

Providing organizational and informational assistance to these county committees is a major effort of the state Extension CRD staff. Regional and state specialists also provide technical assistance to local committees. During the year there was a substantial increase in the number of local committees working in the Extension CRD area.

**Housing Programs**

This also was the fourth and final year of the Extension Pilot Housing Program, in which half of the counties of the state were offered training for county personnel in housing educational efforts. Other counties had previously received such training. State specialists assisted counties in organizing housing educational programs and in conducting special schools or seminars. Extension personnel also cooperated with other colleges and departments in sponsoring statewide schools and seminars. One outstanding effort was the cooperative sponsorship of a two-day program for housing inspectors given by the Cooperative Extension Service, the College of Engineering and the Department of Civil Engineering.

The University Housing Committee, organized as part of the pilot housing program involving both Extension personnel and professional personnel from five colleges of the University, was especially active during the year.

The committee developed a proposal for establishing a Housing Institute at the University to promote interdisciplinary research and educational efforts on housing problems of South Carolina and the nation. The Institute will provide administrative support for these efforts, and encourage participation by all professional personnel who have an interest in housing.

**Youth Involvement**

Pilot efforts to involve youth in community development have received national attention. A national workshop pin-
pointed techniques for involving youth in community development and the U. S. Congress appropriated funds to expand pilot efforts in all states.

Specialists in the 4-H program and in CRD combined efforts to offer two days of training aimed at involving youth in community and resource development. Training was conducted in each of the three Extension districts. Since then, several counties have organized youth clubs to work in CRD. In addition, Abbeville County was selected for an intensive pilot effort to involve youth in community development. A supervisor and four program assistants were employed to develop the Abbeville County program. Further expansion to develop leadership abilities of youth in community development is expected in 1973-74.

Special Programs

Broad Scope of Activity: Extension’s Special Programs area coordinates efforts to reach people with limited resources and their families by providing educational information designed to carry out the primary Extension function of “helping people to help themselves.”

The key to this approach is working with disadvantaged segments of society through professionals aided by “para-professionals” drawn from the communities being served.

This encourages people with limited resources to develop their own leadership and constructively interact with society. Having a basic distrust for “outsiders,” these people can be more effectively reached when voluntary educational programs can establish leadership within their own ranks.

Extension, through its special programs, endorses action committees in all counties composed primarily of members from the low-income sector. These committees address problems and needs of their own group. Extension provides guidance and direction.

Rising costs of production, decreasing returns for products sold, and the trend toward large, mechanized operations in South Carolina’s agriculture have created the impression that the small family farmer is disappearing. Yet, the last Census of Agriculture showed 68 per cent of the state’s 40,000 full-time farmers grossed less than $10,000 annually.
Extension's special programs are designed for and directed toward improving the "small farm" situation for low-income people.

This program uses the para-professionals to achieve a two-fold objective. The first is to expand individualized assistance and counseling for small farmers who generally are not reached by on-going programs. The second is to involve small farm operators in educational activities that should increase their agricultural income and improve their level of living.

Assistant para-professionals are responsible for:
- Assisting in identifying and selecting small farm co-operators.
- Working with small farmers on an individual basis in evaluating enterprises and making recommendations.
- Assisting small farmers in carrying out recommended practices.
- Planning and initiating small group meetings to conduct method demonstrations and discuss agricultural topics.
- Being knowledgeable of available programs in order to encourage small farmers to use appropriate ones such as ASCS, SCS, FHA, including full Extension resources.
- Assisting Extension staff in planning and conducting result demonstrations on small farms.
- Assisting small farm families in planning and making improvements around the farm and home.

The "small farms" program has demonstrated that efforts to improve the situation of limited income families was enhanced by use of para-professionals. Since there must be a high degree of person-to-person contact in disseminating information, the agricultural science assistant was able to render more individualized assistance. Using the proved method of result demonstrations, lessons are taught on the farm.

These demonstrations are beneficial because they use real farm problems, resources, labor, equipment and investment potential. More profit from farm crops and livestock is the goal.

In addition to demonstrations on small farms, educational efforts with small farmers also featured tours, workshops, radio, television and newspaper articles.
Special attention was given to establishing specific demonstrations, including:

- All-practice soybean demonstrations using the latest scientific techniques in herbicides, fertility, insect control and harvesting.
- Feeder pig production demonstrations for graded feeder pig markets.
- Swine feeding demonstrations for top hog markets.
- Production of home gardens on individual family and community bases.
- Assistance for farmer cooperatives in producing vegetables under contract, and roadside marketing of vegetables.

1890 Extension Program

Broad Scope of Activity—Another arm of the Extension program which reaches and provides leadership for rural families with limited resources is the 1890 Extension Program conducted by South Carolina State College in cooperation with the Clemson University Extension Service.

South Carolina State College is the 1890 Land-Grant College of South Carolina. The program is federally funded for 1890 institutions.

This coordinated effort provides another approach for grass-roots education and outreach for segments of the population that are out of touch with traditional uplift programs.

The program is directed by a coordinator at South Carolina State College. The Clemson University Extension Service cooperates through joint use of resources and programs.

The 1890 Extension Program now functions in five counties: Chesterfield, Georgetown, Hampton, Marlboro and Orangeburg.

The program provides leadership for limited resource rural families in improving their quality of life. Efforts are concentrated on three project areas: community resource development, family living and youth programs.

An integral part of the 1890 Extension work is direction and demonstrated teaching to motivate self-help for the families. Efforts during the year required cooperative aid embracing social service agencies, county school boards, county
Extension agents, state Extension personnel, and others working with the 1890 program staff.

Specialists from Clemson helped train program aides in the five counties. The county Extension offices provided cooperative leadership in nutrition education. County health departments cooperated in a rat control project. County school boards, county legislative delegations, county Extension offices, and religious groups assisted in locating buildings for demonstration centers.

The 1890 program sought and received a “Special Needs Grant” of $120,000 from the USDA-Extension Service to conduct a summer camping program for youth from low income families. This grant extended the summer camping program for at least three more years. The 1973 summer camps provided learning experiences that were intended to lift the aspirations for some 700 disadvantaged rural youth to seek a better life through traditional means.

South Carolina State College cooperated with the 1890 camping program by renovating dining facilities of Camp Daniels and repairing the living quarters. The 1890 Extension program staff is grateful to the administration of Clemson University and South Carolina State College for their support of the summer camping program.

Accomplishments

Some of the most significant accomplishments of the 1890 program were:

—Acquiring use of buildings and grounds for demonstration centers in each county. Centers were officially opened in Hampton, Chesterfield, and in Georgetown. A building also was obtained in Marlboro County and efforts were made to put it into use. A tentative commitment was made by the Orangeburg County Delegation for a building in October.

—Youth program coordinators, at the level of associate county agents, were assigned to the program in each county. They organized community clubs for eligible youth who participated in projects of their choice. The youth program in Hampton County had its “First Field Day” at the Hampton County Demonstration Center.
—During July and August, girls from low-income homes were taught to make simple garments in the sewing room at the center. Some of them made school blouses, dresses and skirts at a substantially reduced cost to the family.

—People participating in the Homemaker’s area of the program preserved peak-season fruits and vegetables for their own use, and made some of their own clothing. As indicated by their interest and support, the county people understand the purpose of the 1890 program. One of the most evident indicators of acceptance and support by county people was shown in Hampton County, where businesses, civic and religious groups cooperated with the youth program coordinator by underwriting the cost of a field day at their County Demonstration Center. Parents and other adults came out for the basketball game and other sports, and participated in throwing horseshoes.
### APPROPRIATIONS FOR EXTENSION SERVICE

1972-1973

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**Total Appropriations:** $8,441,729

### EXPENDITURES BY PROJECTS

1972-1973

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**Total Expenditures:** $7,768,020

Unexpended Balance June 30, 1973                           | 673,709    |

**Unexpended Balance:** $8,441,729