SONOCO leadership meets the challenge...

...the only yarn carrier research facility!

The only yarn carrier research facility in the world is located at the Sonoco plant in Hartsville, S.C. Thus, Sonoco stands alone with the modern equipment and the experience needed to solve the industry's yarn carrier problems. This valuable service is always available to Sonoco customers at no charge.

Continuous research at Sonoco covers all phases of yarn processing and the related utilization of paper cones, tubes, cores and spools. This effort is specifically directed toward developing better, more economical yarn carriers for use in the production of improved textiles.

Every Sonoco product has this extra ingredient of research background, representing more than 60 years of leadership. That's why you can always look to Sonoco for the best in yarn carriers!

See SONOCO-Southern Textile Exposition-Booth No. 405
THE Bobbin & Beaker
Official Student Publication
Clemson School of Industrial Management and Textile Science

VOL. 22 FALL ISSUE 1964 NO. 1

The Staff

Editor
Henry M. Poston
Johnsonville, S. C.

Managing Editor
Bruce R. Edwards
Tryon, N. C.

Advertising Manager
W. Wesley Connelly
Spartanburg, S. C.

Circulation Manager
Marshall White
Rock Hill, S. C.

Ass't. Advertising Manager
Sanders E. Goodman
Salisbury, N. C.

Faculty Advisers
D. P. Thomson, Jr.
D. R. Gentry
Dr. C. H. Whitehurst, Jr.
Wallace D. Trevillian, Dean

In This Issue

From the Editor 5
What Does the Industry Expect of a College Graduate 7
Seminar Hi-Lights 10
New Faculty Members 12
The Second Milestone 14
Outstanding Seniors 15
Sirrine Library Expands 16
Thinking 17
Scholarships 18
Courses for Professional Development 19
Undergraduate Research Abstracts 20
Kotten Korner 26

THE BOBBIN & BEAKER. Organized in November, 1939, by Iota Chapter of Phi Psi Fraternity, and published and distributed without charge four times during the school year by students of the Clemson University School of Industrial Management and Textile Science. All rights reserved.

Address: The Bobbin and Beaker, School of Industrial Management and Textile Science, Clemson University, Clemson, South Carolina.

POLICY—
The views and opinions expressed in all guest articles are those of the writers themselves, and must not be construed to necessarily represent the views and opinions of the Editors of this magazine or of the faculty of the Clemson University School of Industrial Management and Textile Science. No article in BOBBIN & BEAKER, or any part thereof shall be reproduced in any form without permission of the editor. Requests may be forwarded to Editor, THE BOBBIN & BEAKER, School of Industrial Management and Textile Science, Clemson, South Carolina.

THE BOBBIN & BEAKER is a non-profit magazine organized to serve Clemson students and the textile industry. We ask our readers to consider favorably our advertisers when buying.
Special

TEXTILE DICTIONARY
for BEST RESULTS
in Textile Processing

C
Corbex (Kör'baeks) A durable anti-bacterial additive for textiles. Provides fixed, lasting protection against pepsin, mildew, perspiration and other types of bacterial origin.

D
Discollite* (dīsolkō-īte) Concentrated sodium sulphochlorate formaldehyde available in lump, pebble, rice or powder form.

Dispersall (dīs-pərs′al) A long chain ethylene oxide condensate in the form of a colorless, neutral, somewhat viscous liquid. Fully resistant to hard water, and miscible with water in all proportions. A retardant and leveling assistant in vat dyeing. Used widely as a dispersing agent in dying synthetic fibers with dispersing colors and for fast color bases and dyes in Naftol dyeing and printing.

Effective in stripping to prevent redeposition of the color on stripped goods.

N
Neofinish (Nef′, O-Finish) Non-ionic softener dispersible in hot water, suitable for all textile fibers, both natural and synthetic. Compatible with all types of finishing materials, including resin finishes. No development of color or odor in goods finished with Neofinish, even in storage. No yellowing at time of application.

Neowet (nō′wet) Complex Polyethylene Ether in the form of a pale yellow, slightly viscous liquid. A non-ionic surface active wetting agent, effective at all temperatures. Completely compatible with enzymatic desizing agents and readily soluble in water. Contains 55% active ingredients. Widely used in souring all types of textile fabrics and for general wetting purposes.

O
Organic Ether Sulphonate in the form of a water white slightly viscous liquid.

P
Parolite* (pərō′līte) Zinc sulphochlorate formaldehyde in the form of white crystalline powder. A highly concentrated stripping agent for all forms of wool and modern synthetics. Completely soluble in water. Leaves stripped goods soft, completely free of zinc dust and in most receptive condition for further processing. Often completely strips goods where other stripping agents fail. Very effective in discharge printing on acetate rayon.

V

Available with optical whites and in buffered formulas for high temperature use without excessive alkalinity.

Velco Softener (vel′kō) A highly sulphonated tallow in the form of a creamy white paste, easily dispersed in water. Used in general finishing of all types of textile materials. Will not "smoke off" or change color in high temperature operations such as calendering or drying. Has no effect on light fastness of colors.

Strategically placed warehouses plus company owned trucks add up to fast dependable delivery, every time.

Royce CHEMICAL COMPANY
EAST RUTHERFORD, NEW JERSEY
News! This is the theme. Throughout the Fall Issue are items of interest to those here at Clemson and to those in industry. This news is of the past, present, and future. We have tried to bring you up to date on some of the things that have taken place since the last issue.

We would like to thank Mr. George Asnip for an excellent article on "What the Industry Expects of the College Graduate."

The staff hopes that you enjoy this first issue of the new school year.

—H. P

Left to right: Wes Connelly, Henry Poston, Marshall White, Bruce Edwards
A Big Name in Apparel and Household Fabrics

A well known and highly respected fabric producer for many years, Dan River's growth and expansion since World War II can only be expressed by one word — PHENOMENAL.

We are proud that we have been privileged to participate in Dan River's many multi-million dollar modernization projects through the years.
What Does The Industry Expect Of A College Graduate

By George Asnip

Biographical Information

Active duty with the Army 1941-46 in the Ordnance Department — Rank Lt. Colonel.

Joined Pendleton Manufacturing Company and Blue Ridge Yarn Mills as General Manager and Vice President 1946.

In July, 1947, became affiliated with the Deering-Milliken organization as head of the Production Planning and Control Department at Judson Mills. In 1949 was promoted to Plant Manager of the Gerrish Milliken Mill at Pendleton; in 1953 was promoted to General Manager of Laurens Mills and made General Manager of the Worsted Division in 1955. In 1957 was appointed Vice President and Treasurer of Abbeville Mills and the Worsted Division of Excelsior Worsted Mills. In 1960 was appointed President of the Manufacturing Division of Excelsior Worsted Mills and Abbeville Mills. Elected by the Board of Directors of Milliken Woolens, a Division of Deering-Milliken, Inc., as Vice President in charge of manufacturing and sales of all woolens and worsted sold through Milliken Woolens.

Past President of the South Carolina Textile Manufacturers Association; former executive vice president of the National Association of Wool Manufacturers, and a former director of Woolens and Worsted of America.

A member of the J. E. Sirrine Textile Foundation.

What is the Textile Industry looking for in young men joining us from college today? To answer this, requires a review of the industry as well as a review of managerial qualities needed in the industry. I would like to cover these separately.

The Textile Industry is at a crossroad where it can capitalize on the significant breakthroughs of fiber, manufacturing, and finishing technologies that have been recently made. In addition to these technical strides, there has been a considerable replacement of antiquated machinery in addition to the applications of modern Data Processing administrative techniques. We need men technically qualified to take these breakthroughs further and to fully develop their application. We need well trained minds in all of the academic disciplines. Our needs and the extent to which we can utilize this technological skill are equal to any other industry.

Because the general public is not fully aware of this progress, textile companies and the caliber of their people are often misunderstood and criticized, but the successful operation of textile plants in the South has been the essential building block of the South's industrial growth and diversification. The adage of "success begets success" could never be more pertinently applied. The new non-textile plants springing up around us are proof of the fact that other manufacturers recognize our success. Remember this the next time you listen to our critics.

The textile industry has many things to be proud of; but let me say again that we are at a crossroad. Foreign competition and government intervention is taxing our ability to earn profits justifying continued investment and stockholder support. We have a real job ahead of us.

But you are probably asking yourself, what does this mean to me? Very simply, it is this — because our challenges equal our accomplishments the opportunities open to young men in our industry are comparable or greater than any other industry in our nation and particularly in the South. This leads me to the second part of my subject. — What kind of personal characteristics does the industry need in its management of tomorrow?

The answer to this is so simple that it should hardly have to be given. However experience proves what I am about to say and what others have said before me either hasn't been heard or it hasn't been believed. The acute shortage today of men rising to the top in industry, who are willing to make the sacrifices and to take the risks, validates my case. Unless your age group is made up of a different set of drives, ambitions and character qualities, than some of the age groups preceding you then many of you won't believe what I have to say either. I am sure that last statement is antagonistic, but I have made it to convey my real concern of trends I observe and to hopefully improve your chances for success. This success formula consists of four ingredients — In-

FALL ISSUE 1964
tegrity, Intelligence, Industriousness, and Independence.

Now there is nothing very complex about these four qualities, but again let me say that what ought to be crystal-clear logic seems to have been obscured in this day of the fast buck and compromise for security and the status quo.

So that you don't feel you are being subjected to pious, impractical idealism, let me add weight to my argument by saying I have never known a man who has truly succeeded and kept his self-respect in the process, who wasn't long on all four of these attributes.

**Integrity** is more than basic honesty or truthfulness. It includes unwillingness to compromise, loyalty to your boss and company, and defending what is right rather than what is expedient. We have been hearing a lot lately that effective politics and — by implication — effective management of human affairs, is "the art of the possible," but often this is cheap compromise. I am not suggesting that effective management doesn't require a melding of separate points of view in getting the best from each contributor. But it isn't taking the most popular course either. Effective organizations aren't run as democracies, and never will be. Every team has to have a captain and popularity is rarely equated with profit.

Loyalty to your boss and company is another basic which often gets forgotten. I am not talking about "yes men" or apple polishing. I am talking about pressing for what you believe is best, but after you have had your say and a decision has been reached, then fully supporting it. You will be surprised to find when you enter industry to what extent most companies go in getting opinions and suggestions flowing up the organization structure. But I think you will agree that after all the ideas and facts are in, decisions must be made. If these decisions are contrary to what you think best, ask yourself, if you lacked persuasive skills before you jump to conclusions of being knocked down by an arbitrary autocrat. The thing to remember is that a man of integrity, after a course of action has been chosen, has only two alternatives. To support the course of action or to get out.

 Expediency will be a constant pressure you'll face, and I am not minimizing the need for action and results, but most of the bad decisions I have observed have been bad because they were expedient and shortsighted. You will need to continually discipline yourself to look beyond tomorrow to acquire a greater sense of the future if you are going to contribute to minimizing long term problems or failure.

**Intelligence** is the second characteristic and what do I mean by that? IQ? Hardly!

Some of the most successful business managers I have known would not score exceptionally well on those tests psychologists tell us measure intelligence. Conversely, other men who have disappointed me most, are those who supposedly have all the facts and are completely lacking in judgment. My definition of intelligence includes awareness of what is around you and what is happening. It includes sensitivity to other people's attitudes and opinions. Most importantly it is the ability to deal with basic, proven principles, rather than obscuring the problem with fuzzy edged abstractions.

Awareness of your environment and the people around you is the other aspect of intelligence. Too long businessmen have limited their span of attention to day-to-day physical problems viewed through tunnel vision. Let's say that if all of us don't acquire a greater awareness of these forces, and if we don't make a real effort to deal with them, then our days are numbered when we will be able to do something about our environment.

The third quality is **Industriousness**, and if I wanted to be trite, I could say "hard work never killed anyone" or "a good man is never overloaded," and I know that industriousness or hard work is often equated to the number of hours worked. What I would like to suggest to you is that you find ways in which to do more in less time. You all know that it is a rare individual who operates at more than 20 or 30% of his capacity. The task that all of us face is to increase this percentage. While you will have to find ways to personally be more effective in a shorter period of time as management of the future, you will have to find ways in which to motivate subordinates so that they will better utilize their time. Lack of motivation can often be attributed to an individual's lack of purpose or an absence of personal goals.

Many managers used to think, particularly in less affluent times, that money or threatened job loss used to motivate. It is now an obvious fact that what makes a good man tick, and this is particularly true of the better people, is his realization that his work is worthwhile and that he is achieving meaningful results and being recognized for his contribution. For many of you, your first jobs in industry — after some initial training — will be the supervision of production or clerical employees. You will find that if you threaten them or promise them something of temporary value, they will only perform at a level sufficient to avoid pain. But if you lead them in honorable, profitable tasks, you will find them pushing you to greater accomplishment than you might think possible. General George Patton had a "famous wet noodle" speech that he gave his officers. He would take a wet noodle in a saucer and prove that the noodle can't be pushed but that it must be pulled. Industrious leadership is getting out in front of your people and committing yourself to the task even

EIGHT
more than you are asking them to commit — leading by example, not precept.

Let me say again that the quantitative measure of hours is meaningless. I never measure any of my associates by the hours they work, but by what they get done. The interesting thing is, that the more successful men I have known, appear to work long hours when first assigned to a new responsibility, not only to get the job under control, but to get it running smoothly enough to get into a position where they have more leisure time. Then we promote them and they start all over again.

Seriously, though — while hours worked isn’t a valid measurement, too many young men today have taken this principle too far and they appear to feel that there should be a maximum number of hours that an individual should devote to his job. If there is a maximum, I don’t know what it is. I do know, however, that this is never a problem with men properly utilizing their time and discipling their energies.

The last quality is Independence. There is a need for teamwork when our nation’s greatness comes from the concept of freedom of the individual. Freedom to try, freedom to succeed and yes, freedom to fail. Today, we hear a lot about “the Organization Man” and stifling conformity, but no successful enterprise can maintain its position of success without independent men searching independently for new products, manufacturing processes, and sales strategies. There is a need for teamwork when plans have been made and goals set, but if fresh concepts aren’t introduced when the next series of goals and objectives are established, then all that is maintained is an existing pattern or plateau of performance.

It is difficult to be an independent thinker. You run the risk of being wrong, you make the sacrifices of possibly being misunderstood and ridiculed. But if you don’t keep your independence and your freedom of thought, then what is whatever you gain worth, anyway?

I have covered the four qualities that experience has shown me to be essential to business success. I have stated them in a positive, but I hope not authoritarian terms. Certainly the development of these qualities requires determination, and they leave little room for bending or compromise. They are not particularly comfortable to maintain.

If you find these ideas of mine hold true spread the word. Unless your generation makes more progress than mine has in having these simple truths understood, then there will still be a need for more people endorsing: Integrity, Intelligence, Industriousness and Independence.

---

CONSULTING ENGINEERS SERVING THE TEXTILE INDUSTRY

Investigations, Consultations, Reports, Design, Construction Supervision

J • E • SIRRINE COMPANY
ESTABLISHED 1902
GREENVILLE • SOUTH CAROLINA
SEMINAR HI-LIGHTS

The curriculum of each student at Clemson majoring in either Textiles or Industrial Management is highlighted by a seminar course that is offered to him. The seminars are offered in two courses. The industrial management seminar is offered to all students seeking a degree in Industrial Management, and the textile seminar is offered to all textile seniors, and all other students (textile and industrial management), the faculty of the School of Industrial Management and Textile Science, research personnel, and any other interested persons.

The speakers are composed of outstanding men of the business world. These high executives are invited to discuss problems of mutual interest with our students. The fields of the businessmen are widespread throughout business and industry. This wide variety allows the student to become acquainted with each aspect of the business world.

It is certainly a privilege for the Clemson student to have such outstanding speakers in his midst. There are very few places one could hear such a group of proven businessmen at such convenience.

The textile seminars are as follows:

September 22nd — Mr. George Asnip, President, Woolen-Worsted Group, Deering Milliken, Inc., “What Does the Textile Industry Expect of a College Graduate?”

September 29th — Mr. J. C. Spangler, Director of Employment, Dan River Mills, Inc., “Recruiting of College Students.”

October 6th — Mr. T. E. Stribling, Jr., Senior Consultant, Werner Textile Consultants, Division of Werner Management Consultants, Inc., “Opportunities in the Consulting Field.”

October 20th — Mr. W. J. Martin, Cotton Utilization Specialist, United States Department of Agriculture, “The Extension of the Cotton Utilization Program.”

October 27th — Mr. M. Earl Heard, Jr., Vice President, Saco-Lowell Shops, “The European Textile Market and International Sales.”


November 10th — Mr. Thomas B. Sain, Executive Vice President, Burlington Hosiery Company, “Research and Development in the Hosiery Industry.”

December 1st — Mr. F. S. Love, Secretary-Treasurer, American Textile Manufacturers Institute, Inc., “Public Relations in the Textile Industry.”


January 5th — Mr. W. Stanley Finch, Director of Public Relations and Sales Training, Texize Chemicals, “The Importance of Clear Communication.”

The Industrial Management seminars are as follows:


November 5th — Mr. Harvey T. Stephens, Senior Vice President, Automatic Retailers of America, Inc., “Creative Management.”

November 19th — Mr. William C. Laffoday, National Retail Sales Manager, Sears, Roebuck and Company, “Personality Development.”

Second semester speakers will be Marion M. Johnson, vice-president, Brown-Forman Distillers Corp., Louisville; John A. Laberee, southern district manager in the extension division of the Du Pont Co., Atlanta; and James F. Lincoln, Chairman of the Board of Directors, Lincoln Electric Co., Cleveland.
NOW
Completely new!

WELLINGTON SEARS
HANDBOOK OF
INDUSTRIAL TEXTILES

From Wellington Sears—a new 757-page definitive source of useful, up-to-date information on all aspects of modern industrial textile technology. This important book belongs on your desk. You'll find yourself referring to it daily.

Just published...the authoritative new Wellington Sears Handbook everyone has been waiting for. It was written expressly for Wellington Sears by a leading textile expert, Ernest R. Kaswell. This new Wellington Sears Handbook meets the needs of modern textile technologists of all kinds...as well as purchasing agents, production executives, designers, sales engineers, educators and students.

Comprehensive. Easy to Use. Major aspects of industrial textile technology are fully covered. Contents are arranged to help you find the facts you want quickly and easily. And the new Handbook is even broader in scope than the original Wellington Sears Handbook, previously published in four editions, famous for years as a standard text used by leading textile schools and colleges, and by industry throughout the world.

Every Page New and Current. You'll find chapters devoted to both natural and man-made fibers...manufacturing processes: yarn spinning and twisting, weaving, fabric dyeing and finishing...industrial fabric constructions and end-uses...properties and applications of every modern fiber...yarn and fabric geometry and technology...principles of physical and chemical test methods...and much more.

The Whole Industry Between Covers. Nowhere else but in this authoritative new Wellington Sears Handbook will you find so complete and accurate coverage of the entire field of industrial textiles.

WELLINGTON SEARS
111 W. 40th St., New York 18, N.Y.

Order your copy of this valuable reference book now.

Name___________________________

Company_______________________

Address________________________

City___________________________ Zone____ State______

Publications Department BB-10
Wellington Sears Co., 111 W. 40th St., New York 18, N.Y.

Please send me—— copies of the new Handbook @ $15.00 ea.
Check or money order enclosed———, Bill me———.
The Bobbin and Beaker staff and the School of Industrial Management and Textile Science would like to welcome three new additions to our faculty.

C. O. SHULER

One new member of the Industrial Management faculty is Mr. C. O. Shuler. Mr. Shuler was born in Aiken County, S. C., and was graduated from Aiken High School. In 1934 he received his B.S. degree in Agricultural Chemistry from Clemson University. He received his M.LITT. degree in Industrial Management in 1951 from the University of Pittsburgh. From 1952 until 1955 he attended the American University in Washington, D. C. He is a candidate for a Ph.D. degree. During 1956 Mr. Shuler attended the Air War College, Maxwell Air Force Base, Alabama.

After finishing Clemson, he worked with Gregg Dyeing Plant, Graniteville Manufacturing Company, Graniteville, S. C. He later joined the Civilian Conservation Corps while it was administered by the Army. Mr. Shuler served continuously, except for a short break in 1946, in the United States Air Force until his retirement in August 1964.

Mr. Shuler is married and has two children; a son who is a freshman at Clemson and a daughter who is a freshman at Daniel High School.

DR. SANG OH PARK

Dr. Sang Oh Park has joined the Clemson University faculty as Assistant Professor of Industrial Management. Dr. Park is a naturalized U. S. citizen. He was graduated from Florida State University in June 1957 with a B.A. degree in economics. In January 1959 he received his M.A. degree in economics from Florida State. Dr. Park received his Ph.D degree in economics from the University of North Carolina in 1957.

Dr. Park has done extended research in the field of economics. He has taught economics at the University of North Carolina, Austin College and the University of New Mexico.

Dr. Park is married and has one child.
Dr. S. M. Willis is with us again. Dr. Willis returned to Clemson this summer as an associate Professor of Industrial Management.

Dr. Willis is a native of Greenwood, S. C., where he attended public schools before entering Clemson.

He was graduated in 1950 with a B.S. degree in Textile Manufacturing after which he taught at Clemson until 1952. Dr. Willis received his M. S. degree in Industrial Management from Georgia Tech. In 1956 he returned to Clemson where he joined the faculty of the Department of Industrial Management and remained until 1962. He received his Ph.D. degree from the University of Alabama.

Dr. Willis worked for Westboro Weaving Company during 1952 and 1953. In 1962 he was plant manager or Milliken Tetra Pak in Spartanburg.
THE SECOND MILESTONE

Without question, the first milestone in the development of the American textile industry was the little cotton mill Samuel Slater put into operation in 1792 in Pawtucket, R. I.

But what was the second milestone?

The question will bring all sorts of answers, but many will insist that the honor properly belongs to the brainchild of a man named William Sprague. He is credited with having introduced “possibly the first actual machine in this country to print color onto cloth automatically.”

The importance of Sprague’s machine was cited in the 1836 publication, “Memoir of Samuel Slater” by George S. White. Mr. White wrote, “Before the commencement of the printing business, the cotton manufacturer was considered in a precarious position, so that no one ventured on the finer fabrics; but since calico-printing has been established, cotton manufactures in the United States may be considered as built on a permanent basis.”

Sprague was a farmer in 1808 when he converted a small grist mill in Cranston, R. I., into a factory for carding and spinning cotton yarn by hand. The mill was destroyed by fire in 1813, but Sprague replaced it with a larger, stone building. In 1824, after expanding to another mill south of his first two, Sprague began to bleach and print calico, the first mass production printing operation in the United States.

There is no concrete proof that Sprague’s machine was the first automatic cloth printing machine in the country. However, there is no evidence to indicate that it was not. There is no question, however, that his was the first large-scale calico printing effort.

Prior to development of the Sprague machine, American textile printing was a hand operation, although the English had developed an automatic process as early as 1735. By the time Sprague opened his first mill in 1808, English manufacturers had introduced steel-dye cylinder engraving and Manchester, England, was a major center for textile printing and finishing.

The importance of Sprague’s machine to the American industry was underscored by the fact that Slater’s mill had applied mass production techniques to yarn production and the same techniques affected weaving in 1814 when Francis Cabot Lowell successfully constructed a power loom at Lowell, Mass. These two developments meant that printing became the great production bottleneck as long as hand printing methods remained in use.

* * * * *

South Carolina’s 344 mills, un congested and located in rural surroundings, employ some 140,948 people who are receiving an annual payroll of approximately $460,270,287.

SOUTHERN LOOM-REED MFG. CO., INC.

Phone IVanhoe 9-4786 GAFFNEY, S. C.

Manufacturers of

Pitch Band REAL REEDS All Metal
Drawing-In Combs
Expansion Combs for Slashers, Warpers and Beamers—New and Repaired
Drop Wire, Heddle and Transfer Bars
Harness Hooks, Leader and Card Wires
Canvas Quill Bags—Lap Picker Hooks

THE BOBBIN AND BEAKER
Outstanding Seniors...

George Millon Plyler, a twenty-one year old Industrial Management major from Lancaster, South Carolina. He has been an honor student every semester.

This year Millon serves as president of the Senior class and president of the Industrial Management Society. He is also a member of the Society for the Advancement of Management. He is enrolled in Advanced ROTC and is a Distinguished Military Student.

Edward T. Samulski, a twenty-one year old Textile Chemistry major, is a native of North Augusta, South Carolina. A Leon Lowenstein scholarship has helped finance his four years at Clemson. He also received an N.S.F. Undergraduate Summer Research Grant this past summer.

Edward has been very active in campus life. He has been a member of the Newman Club, the Young Democrats, the Concert Band, the Chronicle staff, and the Tiger staff. He presently serves as secretary of Phi Eta Sigma and is a member of Phi Kappa Phi.

During the summers, Edward has gained valuable experience by working two summers with United Merchants Seminole Mill in Clearwater, South Carolina and one summer with E. I. DuPont De Nemours at the Savannah River Plant.

After graduation Edward plans to enter graduate school to work toward a Ph. D. in Physical Organic Chemistry.

Henry M. Poston is a Textile Management major from Johnsonville, South Carolina. He is twenty-one years old and is married. To aid with his college expenses he received a Wellman Foundation Scholarship.

For four summers Henry gained valuable experience in the textile industry by working with Wellman Combing Company in Johnsonville. He worked in several different departments including combing, finishing, carding and methods and standards.

While at Clemson, Henry has been an active member of several campus organizations. This year he serves as Editor of the Bobbin and Beaker and president of Phi Psi, the national honorary textile fraternity. He has also been a member of the American Association of Textile Technology and has received honors for every semester.

After graduation, Henry plans to enter the Army for a two year tour of duty.

For the past three summers, Millon has worked for the United States Department of Agriculture in Washington, D. C.

After graduation, he would like to attend graduate school in business administration.
The Sirrine Library will continue, as in the past, to play an ever expanding role in the academic achievements coming to fruition in Sirrine Hall.

Some of the recent acquisitions are as follows:

Accounting Practice Management Handbook. By J. H. MacNeill
Accounting Research & Terminology Bulletins. By A. I. C. P. A.
An Accounting Research Study. By A. I. C. P. A.
Introduction to Industrial Management. By F. E. Folts
Organization for Production. By E. S. Roscoe
Preface To Econometrics. By M. J. Brennan
Principles of Management. By G. R. Terry
Principles of Management and Organizational Behavior. By J. O. Longnecker
Uniform CPA Examination Questions and Unofficial Answers. A supplement to The Journal of Accountancy
On the Accuracy of Economic Observations. By O. Morgenstern
Quality Control and Industrial Statistics. By A. J. Duncan
Statistical Abstract of the United States.
THINKING

An electronic brain is the most misnamed thing in the world.

It can't think.

It can recite only what it has been told, and that isn't really being a brain.

It works fast — far faster than the human brain. It can spew its fund of information far quicker than any human typist. It can probably store more bits and pieces of information than the average human mind.

But it can't think.

It can recite only what it has been told.

It can never know the joy of considering a way of doing something and then realizing there is a better way to do that job.

It can never appreciate the quiet satisfaction of adjusting to new conditions to make a job run smoother.

It can never feel the thrill that comes when something is created where nothing existed before.

An electronic brain is pretty in a simple sort of way.

It is fast and precise and always on the job.

But it is just like so many other machines.

It can do only what it is told to do.

The textile industry has electronic brains and other machines. It has jobs for each of them, but they must be told what to do.

That's what people are for.

They can think.

* * * * *

Over half of the nation's cotton looms are within a 200-mile radius of Clemson University School of Industrial Management and Textile Science.

---

**SALES AND PRODUCTION MANAGEMENT MANUAL**

Practice-Tested Methods and Procedures

By NORBERT LLOYD ENRICK, Ph.D., Associate Professor,
University of Virginia Graduate School of Business Administration;
until recently, Associate Director in charge of Management Services,
Institute of Textile Technology, Charlottesville, Virginia

Over the last fifteen years, Dr. Enrick has served as consultant to mills representing thirty per cent of all spindles in the United States and Canada, including fiber producers, weavers, knitters, and cutting-and-sewing plants. Drawing upon this vast fund of practical experience, he presents here the philosophy and practice of the most modern quantitative methods of management science — using step-by-step procedures, convenient tabular data, and abundant examples and illustrations. He explains in detail methods for more efficient planning, decision-making, and control, not only in textile mill and sewing plant operation but also in marketing, promotion, and merchandising. The result is a book that belongs on the desks of all management, staff, and sales personnel in the textile and needle trades industry.

1964. 191 pages. $7.50.

THE BOBBIN AND BEAKER
School of Industrial Management and Textile Science

FALL ISSUE 1964
SCHOLARSHIPS

Each year the School of Industrial Management and Textile Science is fortunate in having several scholarships to offer to students majoring either in Industrial Management or one of the textile courses. Below is a list of all the scholarships and the recipients for the school year 1964-65.

Burlington Industries Foundation — Bobby J. Partridge and David J. Youngblood.


Ben and Kitty Gosnett — Earl D. McCutcheon.


Seydel-Wooley — Harry M. Anderson.


J. P. Stevens and Co. — Bobby L. Waters, Fred M. Hicklin, Roland L. Connelly, and Richard J. Boland.


Ciba Chemical and Dye Company — Charles D. Miller.

David Jennings Memorial Fund — Wilbur W. Connelly and George B. Sproles.

Carolina Yarn Association — Kenneth A. Eubanks.

Allied Chemical Foundation — Frank B. Eaves.

Southern Textile Overseers Association — James J. McKinley.

Chemstrand Corporation — James R. Smith.

* * * *

In 1963, South Carolina's textile mills produced 57.3% of the value of the state’s industrial production and paid 60.4% of the state industrial payroll.

Adams
Durst
Harris
Ninety-Six

Plants

Greenwood
Sloan
Mathews

75 Years of Progress
1889 – 1964

GREENWOOD MILLS

"FABRICS WITH THE CHARACTER OF QUALITY"

EIGHTEEN  THE BOBBIN AND BEAKER
Courses for Professional Development Completes Another Successful Summer

Dr. Wallace D. Trevillian, Dean of the School of Industrial Management and Textile Science, Clemson University, has announced the completion of a very successful summer for the Courses for Professional Development program. This was the seventh summer of the program, designed to keep persons in industry abreast with advancement in science, technology, and management.

During the current summer 87 persons were enrolled in 7 one and two-week courses. These individuals came from several types of industries and represented: 9 states, India, and West Germany; 39 different type job classifications; 62 industrial plants and 39 companies.

Courses offered this summer were Introduction to Textile Manufacturing, Dyeing and Finishing; Yarn Manufacture; Supervisor Development; Methods Analysis and Time Study; Advanced Textile Chemistry; Basic Textile Chemistry; and Quality Control.

Dean Trevillian also announced that plans are under way for the 1965 and 1966 summer programs in Professional Development, and, in each case, an expanded program will be offered, including several additional courses of study.

Any individual or company desiring a copy of the catalog for summer of 1965 Courses for Professional Development should write to Professor C. V. Wray, Sirrine Hall, Clemson University, Clemson, South Carolina. The catalog will be ready in the early part of April.
Undergraduate Research Abstracts

In 1962 the “Special Problems” course (IM 403) for all intent and purposes became a course in directed individual research.

A requirement for graduation, this course emphasizes independent investigation on a subject of the student's own choosing and interest. Once a subject is approved the student investigator is largely on his own. At the end of the semester a final manuscript detailing his investigation and conclusion is submitted to the professor administering the course for grading and is then permanently filed in Sirrine Library. Note: During the past year several other alternatives for satisfying this requirement have been approved. One is signing up to play the computer “management game.” Others include working on industrial engineering and management problems at local plants and public institutions and working directly under a staff member who is conducting sponsored research.

Editors Note:

With the fall and winter issues, we will publish an abstract of all the undergraduate research papers on file in the Sirrine Library. Thereafter, all abstracts of all papers written in any semester will be published in the next issue following that semester.

Analysis of the Extent of Use and Benefits of Color, Music and Air Conditioning in South Carolina Manufacturing Industries

T. H. Goodson and J. F. Ousley

Because changing the work environment is an effective means to increase worker productivity, industry is spending more than $2 billion annually on environmental factors such as color, music, and air conditioning.

In preparing our paper, we thought it necessary to present adequate background material where possible concerning these factors in industry in general. Our background material was obtained largely from the Clemson College and Sirrine Libraries.

To determine the extent of use and benefits of color, music, and air conditioning in South Carolina industries, it was necessary to send out a questionnaire and letter of explanation (see appendix) to a representative sample of industries in the state.

The questionnaire was prepared to give the type of industry and its main product, and a place was provided for plant size in square feet and number of employees. In indicating which factors were being used at present, we also asked that it be noted if the factors had been added since construction or were included in the construction plan. If any of the environmental factors had been added since the plant was built, we asked that the motives for the additions be stated.

To determine the benefits gained, each factor was listed separately with space provided for benefits to be listed. We expected improved morale, efficiency, and health of worker to be benefits provided by all three factors and improved machine efficiency a possible benefit in the case of air conditioning. Space was provided so that any other benefits could be listed by the recipient of the questionnaire.

Our questionnaire also netted us information concerning limitations involved in using the factors and the reasons for employing the factor.

A total of 70 questionnaires were returned. From this number, we determined that fifty-five plants use air conditioning, thirty-four plants use a planned color scheme, and fifteen plants use a planned music program.

In addition to sending out questionnaires, we conducted personal interviews with representatives of various manufacturing industries.

We have found that in most instances the use of these environmental factors has proven beneficial to those who employ them.

Our conclusions can be summarized by saying that all three factors, whether used collectively or individually, can improve morale, increase worker productivity, and improve the health of the worker, and where air conditioning is concerned, an increase in machine efficiency can be noted. All three factors contribute to better employer-employee relations.

A Comparative Analysis of Selected Radio Stations in Piedmont North Carolina and South Carolina

M. C. Hughes

The primary objective of this study was to compare five selected radio stations in the Greenville, South Carolina; Asheville, North Carolina; and Charlotte, North Carolina, radio market areas in three major areas of operation: management, programming, and technical factors. The material is arranged in a manner that clearly denotes all current operating characteristics of each of the five radio stations covered in the analysis.

Information appearing in the analysis, with the exception of one nationally published market comparison, was obtained by personal interview with the various station managers and program directors of the stations covered in the analysis. The radio stations included in the study were selected on the basis of relative popularity to various types of listening audiences in the Greenville, Asheville, and Charlotte metropolitan areas.

It was found that, while differing greatly in managerial areas, depending on the size of the station, all commercial stations share similarly basic programming and broadcasting principles. In addition, each of the organizations covered in the analysis subscribes to the Radio Code of the National Association of Broadcasters and is also bound by law in programming and equipment areas by a set of operating practices prescribed by the Federal Communications Commission. While leaving a large area for individual preferences as to the types of equipment used, all stations share these governmental and associational restrictions and limitations.
Private vs. Public Power: The Case for Private Power
J. M. Burdette and W. R. Ramey

The purpose of this paper is to uncover the facts from the vast amount of data which has been written on the subject of public and private power and present them in a way which would allow one and lead one to make a correct assessment of the two systems.

The process through which our information was gathered ranged through the spectrum of information gathering. Interviews were conducted with private utilities officials; interviews were conducted with public power officials. Printed matter was sought personally of private utilities; printed matter was sought personally of public power officials. Information was acquired through the mails from private companies; information was acquired through mails from public power officials. We searched the college library; we read from the Congressional Record; leading newspapers were read; magazines which print relevant matter were read. The information to which we had access, we feel, was adequate for thorough treatment of the subject.

A comparison of public and private power systems has led us to conclude that the power need of the nation can best be met by private enterprise.

A Study To Determine How The Economy of Clover, South Carolina And The Surrounding Area, Will be Affected By The Establishment of a Division of The Charleston Rubber Company

D. R. Bodie, Jr.

The primary objective of this study was to determine how the economy of Clover, South Carolina, would be affected by the establishment of a division of The Charleston Rubber Company. Major factors of Clover’s economy that were analyzed included employment, retail and wholesale sales, real estate, taxes, utilities, banking, agriculture, contractual services, transportation, and education. Methods used in order to obtain information for this study consisted mainly of interviews and correspondence with informed parties.

It was found that the economy of Clover stands to benefit greatly from the presence of The Charleston Rubber Company. Areas that received the greatest benefits were those of employment, retail and wholesale sales, transportation, and utilities. In the long run, the areas of contractual services and real estate stand to prosper. The level of total spending will certainly be increased in the area.

The Growth, Development, Operation and Economic Importance of the Concrete Industry in the Greenville Area

D. R. Folendore

The objective of this report was to determine the economic importance of the concrete industry in Greenville, South Carolina and the surrounding area. The study began with a brief history of the concrete industry, then, reasons for its growth and development, followed by a discussion on the operation of a modern concrete plant, and finally, an attempt to define the economic importance of this industry.

Most of the material for this report was obtained from personal interviews with key executives in the concrete industry in the Greenville area. A great deal of information was collected from material secured from the Greenville Chamber of Commerce and from library research. Also, a small portion of the analysis came from the author’s knowledge of the concrete industry, having worked in a concrete plant in southern Florida for two summers.

Although the concrete industry in the Greenville area is small and does not pour a great deal of money into the Greenville economy, it is nevertheless important. Its importance lies in the fact that it is a necessity. That is, industry coming to the area must have concrete in foundations, columns, sidewalks, and sewage systems for plants; the State Highway Department depends on concrete for drainage systems, medians, and bridges; the people of the Greenville area must have concrete for their homes, driveways, sewage systems, and they also use a considerable amount of concrete for things such as terraces, fireplaces, pools, and walkways.

Private Trucking in South Carolina

Pete Ayoub and Virgil Marlowe

The purpose of this report was to attempt to conclude whether private trucking or commercial trucking is a predominate in South Carolina. This was followed up by a general outlook for the future.

Once concluded that private trucking is predominate, the authors set out to substantiate this choice. In order to better do this, the advantages and disadvantages of both private and commercial trucking were discussed. Opinions taken from questionnaires sent to various industrial firms in South Carolina helped to support and in some cases initiate these advantages and disadvantages. Personal interviews served the same purpose.

In South Carolina, as in the nation as a whole, the use of private trucking has shown a steady increase over the past ten years. Today, approximately 73 percent of the industrial firms use private trucking as compared to 71 percent for the rest of the nation. The future is expected to hold a continued increase in the use of private trucks.

Analysis of Industrial Civil Defense Preparedness in South Carolina

J. C. Caban and B.R. Shillinglaw

In this era of the nuclear weapon it is necessary for our nation to stand prepared for whatever course the future may take. A well-planned nuclear attack could completely demobilize a nation’s economy in a matter of minutes unless protection had been supplied beforehand. Therefore, industrial civil defense is a prerequisite for a secure nation. It was this need for protection that inspired our study of industrial civil defense preparedness in South Carolina.
The purpose of this study is to analyze and evaluate the industrial aspects of nuclear survival. The study is confined to industrial firms solely in South Carolina and shows how many such businesses have written plans for survival.

The method used in the study includes three major steps. The first step is a description of an adequate plan of industrial survival within a given plant. The second step is a view into South Carolina’s industrial network on a county-wide and industry-wide basis, showing its degree of preparedness. The third step is a description of a plan for post-attack recovery.

The data used in the study were obtained primarily through Colonel Fred C. Craft, Director of the South Carolina Civil Defense Agency.

The basic survival plan described is one developed by the U.S. Office of Civil and Defense Mobilization as a ten-step procedure applicable to any industrial firm.

In the second step, the basis of the paper, the actual figures are revealed. It was found that only 4.4% of the state’s industrial firms have made any preparation for nuclear attack. Of all the various types industries in the state, only four are represented by any plan at all. These are the Photographic Film Industry, The Utility Complex, The Textile Industry, and The Pulp and Paper Industry. The percentage of preparedness of each of these (ratio of number of plans to number of firms) is as follows: Utilities, 27%; Photographic Film, 13%; Textiles, 4.9%; and Pulp and Paper, 3.9%.

In the third step, a description of a basic recovery plan, a procedure to facilitate resumption of production after an attack is discussed. Also, it is found that certain industries have a better chance for survival and recovery than others. Since only four industries have any plan at all, it can be seen from the above figures that the Utility Company has the best chance for speedy recovery. Second would be the Photographic Film Industry, third would be the Textile Industry, and fourth would be the Pulp and Paper Industry.

A general conclusion from the facts in the paper is that South Carolina’s industries are poorly prepared for nuclear attack.

The Managerial and Financial Structure of Anderson Memorial Hospital, Anderson, South Carolina

W. B. Hambright and L. E. Wright

The primary objective of this report is to analyze the managerial and financial structure of Anderson Memorial Hospital as a representative non-profit organization and to determine its uniqueness, if any, to that of a comparable size industrial firm that considers profit as its main goal. The main problem faced by the authors was the lack of informative printed material concerning the hospital. As a result, a major portion of the material gathered was obtained by frequent personal interviews, attendance at departmental meetings, and observations within the hospital.

The analysis includes a discussion of the history, managerial structure, financial structure, communications and controls, and changes proposed by management. It also pointed out that the hospital faces economic and social problems different from those faced by industry.

Based on the information gathered, the authors of this report conclude that there is very little difference between the managerial and financial structure of the subject organization and that of a comparable industrial firm. Speaking in terms of these structures, they only differ in the goals they strive to attain. While the hospital regulates its activities to facilitate patient care and to serve the general public, an industrial firm utilizes the available factors of production in the most efficient manner so as to reap returns in the form of financial profits.

Expansion At Dixiana Mills

Glenn W. Brinson and L. Derrick Grantham

The primary objective of this paper was to analyze the expansions of Dixiana Mills, Dillon, South Carolina, since it began operations in 1954, and on the basis of the results of the investigation, make a predication about expansion in the near future.

The authors analyzed the history of Dixiana Mills from its beginning and the history of Mahasco Industries, Inc., of which Dixiana Mills is a part. This is a part. This investigation also included analyzing the different expansions at Dixiana. The authors made some research in Sirmine Library about the carpet industry as a whole.

Based on information gathered about Dixiana Mills, Mahasco Industries, Inc., and the carpet industry as a whole, the authors of this paper predict that Dixiana Mills will have to expand again by 1970 to meet the anticipated demand for tufted carpet.

An Analysis of the Alternative Uses of the Donaldson Air Force Base Complex After the Move of the Base from Greenville, South Carolina

Grady L. Ballentine and Gerald L. Stafford

The primary objective of this study is to make an analysis of some of the alternative uses of the Donaldson Air Force Base complex after the move of the base from Greenville, South Carolina. A background of the base and the events leading up to its final deactivation are included to show that Donaldson has in actuality been a temporary base since its deactivation in 1942.

The data for the study were gathered by personal interview, personal observation, and library research. Information was also obtained from correspondence with companies and organizations interested in locating at Donaldson. Because of the existence of...
very strict government channels, the United States Air Force did not provide any data requested from it. Two significant findings were made in this report. First, from a review of the history of the base and the events leading up to its final deactivation, it was evident that in actuality the base has been a temporary one since its activation in 1942.

Second, it was found that the base could not be economically utilized singularly for any one specific purpose other than as a military airbase. Therefore, maximum utilization for the base complex would be achieved if it were divided up and used for different purposes. A multi-purpose plan for the most efficient and economic utilization of the existing facilities is recommended.

International Controls in a Textile Finishing Plant

Barry N. Bolding

This paper is an analysis of the internal controls employed in a representative textile finishing plant. The analysis begins with the definition of internal controls as here used. The problem is defined and proposed methodology is stated. From here, the analysis progresses to a complete discussion of the plant itself, its history, status, organizational structure, and the internal controls used. An analysis of internal control theory is then given and from these two a comparison between the practice and theory is made to determine the relative merits of the organization's internal controls. This comparison shows very favorable conditions exist in this organization in a practice-theory relationship. In conclusion it is seen that the analyzed firm follows all the acceptable theories of internal controls and adheres to these at all times unless the situation demands otherwise.

A Quantitative Economic Comparison of the Compact Car Versus the Comparable Conventional Model in the Greenville Area

Jerry N. Brooks and Ralph H. Ward

In this project the authors wanted to determine whether a compact car was actually more economical than a conventional model in the same price range. One of the major problems in determining the answer to this question lay in the bias information provided by the three major automobile manufacturers. To circumvent this the authors conducted a consumer survey in the Greenville area and also personally interviewed insurance companies, finance companies, tire companies, and automobile dealers in the Greenville area.

There were five major topics on which the comparison of the two models was based: initial cost, including equipment on car, maintenance costs, comfort and styling, safety factors, and resale value. In addition, other factors which the authors considered relevant to the comparisons were also included.

The results of the comparison in all three major sections showed that in the overall comparison the compact car was more economical than its conventional counterpart. The only factor in each comparison which strongly disfavored the compact model was in comfort. In each discussion the compact was sadly lacking in interior roominess and riding comfort in comparison with the conventional model. This factor proved to be the major one which kept many people from buying compacts. Surprisingly enough, there was not a tremendous difference in the gas mileage of the cars which were compared in the survey. The largest difference was only 2.1 miles per gallon when the authors considered the average gas mileage of each car in the comparisons. In the categories of initial cost compared to equipment, styling, and resale value, the compact had tremendous advantages over the conventional models. There was no noticeable difference in safety factors of the second car problem of most American families. The compact is definitely not a family car due to its small size and lack of interior room. It is the authors' opinion that the compact car is ideally suited for a young couple or a second car in a family which also has a conventional model. The compact has its place in the American economy and although it has its limitations, it has become an integral part of the American way of life.

An Analysis of South Carolina's Technical Education Program

James F. Carter and John S. Tharpe

The purpose of this research paper is to analyze South Carolina's new technical education program, and its predicted effects and ramifications. The vast industrialization of the state and the low educational and industrial inadequacy are presented in the paper. The structure, costs, legislation, and curriculums of the system are also presented. The TEC program is a progressive one that offers excellent curriculums, instruction and facilities to qualified persons. The low tuition and general excellence of the program provides almost unlimited opportunity for TEC students. We conclude that the technical education system will be a great attraction to industry and a cultural and educational benefit to South Carolina citizens.
Absenteism in the Textile Industry of South Carolina
James L. Coggins and Robert E. Scott

This study relating to absenteeism was made for the purpose of obtaining useful information concerning the reasons for, conditions affecting, and variances of absenteeism. In the beginning it was intended to rely solely on information derived from textile plants of South Carolina, but it was found necessary to supplement this data with other data derived from textile plants of South Carolina, but it was found necessary to supplement this data with other data derived from periodicals and other such sources.

The paper treats the subject in seven major sections plus an additional section headed Supplementary Findings. The seven sections are:

1. Introduction
2. Predominant Reasons for Absences
3. Variance of Absenteeism in General
4. Variance of Absenteeism Rate Within the Plant
5. Conditions Affecting Absenteeism
6. Results of Absenteeism
7. Conclusion

The first section is concerned with an introduction to the subject of absenteeism. Here, absenteeism is defined and the methods used in obtaining data are discussed. The next five sections are a detailed discussion of the problem of absenteeism limited by these five headings. Section VII concludes the main body of the paper. Included after the conclusion is the section on Supplementary Findings. This section contains methods of controlling and handling absenteeism thought worthy of mention by the authors.

The Possibilities of Establishing a Structural Clay Products Plant in North-West Florida.
Jesse B. Edwards

A study was made to find out if it is feasible and practical to locate a ceramic plant in Northwest Florida.

Information was gathered by written request and personal interviews with people in the ceramic industry and with people and organizations interested in the industrial development in the state.

It was found that there is a definite market for brick and tile and that the concrete block industry is firmly entrenched in the area. The supply of labor for now and the future is more than adequate. Labor laws favor neither labor nor management but are provided to protect both labor and management and to aid them in any way possible. Wages are lower than the national average but all classes of labor are available.

Taxes were found to be no more than those in other states and in many cases are less.

Fuel for power is available at special rates for industrial use. The power furnishing capacity has always been kept ahead of demand. Water is very abundant and is found in a very pure form in most cases.

Transportation was found to be acceptable with a good road and railroad network. Trucking is a rising industry in the state.

Clays were found to be in existence in the considered area and in sufficient quantity but were spread out in small pockets which would mean an extremely large investment in land. The clays are of the correct type and problems encountered in using them in the past have been remedied by modern processes.

It is recommended that the plant not be located in this area unless adequate clay is found at the right price.

Parr Nuclear-Fired Generating Plant and Its Economic Aspects
Coleman O. Glaze and Thomas H. Waughan

The reason that this study was undertaken was to find out the motives of the Carolinas Virginia Nuclear Power Associates in building the Parr plant.

We looked into many aspects of the plant. We studied plant construction, plant location, safety, and employment in the plant. We also looked into the role that the government played through the Atomic Energy Commission.

The reason that the plant was built, as far as the Carolinas Virginia Nuclear Power Associates was concerned, was to study nuclear power and its application in the power generating business. The project is a non-profit making one, and the associates will receive little financial return on their first investment.

At the present time, it is not economically feasible to use nuclear power for the needs of its customers.

The associates are made up of the following companies: the Duke Power Company, the South Carolina Electric and Gas Company, the Carolina Power and Light Company, and the Virginia Electric and Power Company.
The Growth and Development of the Paper Industry in the South and its Future Potential

Russell B. Hebert, Jr.

The purpose of this paper is to give a better insight into the paper industry in the South, and just what it can do and has done for Southerners. It is hoped that the individual Southerner reading this paper will come to realize the vast potential of Southern timber-land resources. The future of the South depends on this realization.

In gathering information for this paper, the personnel of several paper mills were interviewed, individual land owners were talked with, home offices of paper companies were contacted, along with the Clemson Extension Service, and additional research was done in the Clemson University Library.

Some important findings realized from this research are: the South has increased wood pulp output of the total production in America from ten percent in 1920, to over fifty percent in 1963; there are now mills in every Southern state except Kentucky, and these mills consume ninety-seven billion dollars worth of pulp wood annually from Southern forest and provide a total payroll of over sixty million dollars; the paper industry is the fifth largest industry in the nation, and surprisingly enough, seventy-five percent of all Southern woodland is in the hands of private ownership.

There are unlimited opportunities for Southerners in the South, if they will only realize that the color today is green, and that through proper timberland management, they can grow and prosper with the paper industry and the South.

The Tennessee Valley Authority in Theory and Practice

Robert Lewis Johnson

There are three problems to be analyzed. The first problem is to see if TVA operations today are in accordance with what TVA was set up to do as set forth in the TVA Act of 1933. The second problem is to see if the TVA is paying its own way. That is, are revenues exceeding costs? Problem number three is to see if the 152 retail distributors of TVA power are showing a fair return on their investment.

The following conclusions were drawn from information obtained from the Tennessee Valley Authority, the Electric Power Board of Chattanooga, the Knoxville Utilities Board and library sources. First, TVA operations today are in accordance with what it was set up to do as set forth in the TVA Act of 1933. Second, the Tennessee Valley Authority is paying its own way—revenues are exceeding costs. Third, the 152 retail distributors of TVA power are showing a return on their investment, but this percent return on net investment has been declining since 1947.

Simmons Machinery Company, Inc.
EQUIPMENT — SUPPLIES — ACCESSORIES
— TEXTILE MACHINERY —
P. O. Box 202 Phone CEdar 9-7621
GREENVILLE, S. C.

The BEST for
39 years
LOOM REEDS
Greensboro Loom Reed Co., Inc.
Kotton Korner

An Englishman returned home from a trip to America, and was telling his friends about one of the queer American games he saw played at a carnival.

"It is called 'Ohhell'," he explained.

"Ohhell?" asked his friends. "How do they play it?"

"Well, you pay a dime and you get a card. Then a man calls out a lot of numbers and after a while someone yells "Bingo." Then everyone else yells "Ohhell".

* * * * *

Student (to clerk in bookstore), "How much is this paper?"
Clerk: "Seventy-five cents a ream."
Student: "It sure is."

Mrs. Cothran: "That new washwoman has stolen two of our towels."
Ed: "The thief! Which ones, dear?"
Mrs. C: "The ones you got from that motel in Sarasota."

What's the matter with your finger, Harry?
Oh, I was downtown getting some cigarettes yesterday and some clumsy fool stepped on my hand.

* * * * *

The chemistry professor was giving a lesson on the explosive qualities of different chemical compounds.

"This," he explained, "is one of the most dangerous explosives known. If I am in the slightest degree wrong in my experiment we are likely to be blown through the roof. Kindly come a little closer, so that you may follow me better.

* * * * *

The temperance committee heard of a man ninety-five years of age who had never tasted alcoholic beverages, and rushed to his bedside for a testimonial. While they were guiding his trembling hand along the dotted line, an awful commotion arose in the next room.

"What in the world is that?" asked one of the good ladies.
"Oh, that," gasped the old man as he sank back on his pillow.
"That's my Dad. He's been drunk for a week."

Index to Advertisers

Gaston County Dyeing Machine Co. ........................................... 6
Greensboro Loom Reed Co., Inc. .................................................. 25
Greenwood Mills ...................................................................... 18
Fletcher Industries .................................................................... 27
J. E. Sirrine Company ................................................................. 9
John Wiley & Sons, Inc. ............................................................... 17
North Chemical Company, Inc. .................................................. 28
Professional Placement ............................................................... 25
Ralph E. Loper Company ............................................................. 10
Royce Chemical Company .......................................................... 4
Simmons Machinery Company, Inc. ......................................... 25
Steel Heddle Mfg. Co. ................................................................. 13
Sonoco Products Company .......................................................... 2
Southern Loom Reed Manufacturing Co., Inc. .......................... 14
Wellington Sears ..................................................................... 11
What's going on at FLETCHER SHUTTLES?

(They're having growing pains)

Maybe you've heard. We’ve added two new plant additions in the past three years. 15,000 feet of new space each time. Not much, but enough to give us growing pains.

Every foot is completely air conditioned with exacting temperature and humidity control—so important in processing materials that make shuttles.

Growth isn’t all pain. In a new plant modern equipment is installed without lingering around waiting for the old machines to pay out their time. Customers seem to like it, they get top quality, and faster delivery. Fletcher’s shuttle eye reconditioning equipment let’s us rework used eyes like factory-new. At half the cost.

But some folks think this growth means we’re now neck and neck with the big fellows. We’re not. We’re still only third in the Big 3.

It’s just as well that we face up to it. When you’re only third you don’t become self-satisfied.

All Fletcher Shuttes are Fully Guaranteed for Quality and Performance.
The one complete line of Shuttes and Shuttle Parts.

FLETCHER SHUTTLES
Southern Pines, North Carolina
NORTH CHEMICAL COMPANY, INC.
—Sizing Specialists Since 1932—

Bob Lyons, '36
P. O. Box 769
Marietta, Ga.

Arthur Nuttall, '48
P. O. Box 626
Seneca, S. C.

Jimmy Jacobs, '49
P. O. Box 10573 Sta. A
Atlanta, Ga.

+ PLUS +
Mark Mayes, Ga. Tech; Raymond Payne, N. C. State; Charles Elliott, Furman; Merle Borden, Texas A & M; Buddy Young, Ga. Tech; Woody Brown, N. C. State

—ALWAYS READY TO SERVE YOU—

NORTH CHEMICAL COMPANY, INC.
P. O. Box 769 Marietta, Ga.