1954

The Bobbin and Beaker Vol. 13 No. 1

Clemson University

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THE BOBBIN AND BEAKER. Organized in November, 1930, by Iota Chapter of Phi Psi Fraternity, and published and distributed without charge four times during the school year by students of the Clemson College School of Textiles. All Rights Reserved.

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THE BOBBIN AND BEAKER is a non-profit magazine organized to serve Clemson students and the textile industry. The publishing and circulation costs are financed solely through proceeds received for advertisements. We ask our readers to consider favorably our advertisers when buying.
A New Survey:

Earnings of Textile Graduates

R. G. Carson, Jr.
Associate Professor of Textiles

Dr. Carson is a graduate of Clemson, receiving his B.S. in Weaving and Designing in 1939. Since then, he has done graduate work at Georgia Tech where he earned his M.S. in Industrial Engineering in 1950, and in 1953, received his Ph.D. in Industrial Engineering from Michigan State.

Professor J. H. M. Beaty offered the first textile course at Clemson during the fall of 1899, in the upper half of the original Textile Building. The first class graduated during 1900. In the years since then, the other half of the old Textile Building, now the Physics Building, was added, then later the school moved to its present modern building. Since that first class of four men, over 2,000 other men have received degrees from the Clemson School of Textiles, and numerous others have participated in short courses or enrolled as special students.

Last fall, the school began a study of its graduates. The Claude W. Kress Research Endowment Fund provided money for postage, printing, and some clerical work to help carry this project out. Information was obtained from over a thousand graduates. This represents about 63% of those with known addresses, and over half of all the men who have received a degree from the Textile School. Compilation of all the results will not be completed for several months yet, but some information about earnings is available at this time. Since this information will be of interest to so many Clemson men, a report of this part of the study is being made and distributed through the Bobbin and Beaker.

Table I shows the number of graduates, by degrees, for each year since the beginning of the school. In 1933 the Textile Industrial Education Curriculum was transferred to the School of Education so the degrees of the last fourteen men in this column of Table I were administrated by the School of Education. All the others were under the auspices of the Textile School. It is interesting to note that more men have graduated in the last seven years (1043 men from 1948 through 1954) than in the first forty-eight years (992 men from 1900 through 1947). This illustrates dramatically the growth of Clemson College and the Textile School during recent years. At the present time, the school is operating at the level of 115 to 130 graduates per year.

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Table I: Clemson Textile Graduate, by degree, 1900 through 1954

THE BOBBIN AND BEAKER
Usable information about earnings during the year 1953 was received from 857 graduates, ranging from the class of 1901 through the class of 1952. The class of 1953 had not been out in the industrial world long enough to furnish useful information in this respect. In evaluating the results of earnings information, the following factors should be kept in mind:

1. There were few graduates in the early years (1900-1920). Therefore, the sample for these years was very small, and some men who had earned high salaries previously were retired during 1953.

2. Most of the recent graduates have served a tour of duty with the Army or Air Force. This has delayed their entrance into industry and probably caused progress to be a little lower during the first few years out of school than it would otherwise have been.

3. The information was gathered by mail. An initial letter requesting information and a return envelope were sent out. A few weeks later, a follow-up letter was sent to those who had not already replied. It is possible that a greater proportion of the successful men than unsuccessful men sent in information. This could only be checked by actually interviewing a representative group of those who failed to answer and comparing their status to that of those who did answer.

As a result of these factors, there may be some bias in the figures shown, but on the whole, they are probably representative of Clemson Textile School Graduates.

Figure I gives a measure of progress of graduates by class. The line shows the approximate point at which at least fifty per cent of the class reported annual earnings higher than the amount shown. Thus, seven years after graduation, at least fifty per cent of the group made more than $6,000 per year, and nineteen years after graduation at least fifty per cent of the group was making more than $10,000 per year.

![Figure 1: Minimum Earnings of more than fifty per cent of the class.](image)

**Figure 2:** Per Cent of Class with Minimum Earnings of $5,000, $10,000 and $20,000 during 1953.

Figure 2 shows the per cent of each class making more than a specified amount. For example, line "C" shows that about fourteen per cent of the class of 1933 (out of school 20 years) is making more than $20,000 per year.

It is interesting to look for a moment at the 333 graduates from 1901 through 1940 who furnished sal-

(continued on page 13)
Another Example of the Continuous Growth at Clemson:

The Establishment at Clemson of a Cotton Ginning Laboratory

By M. C. Morgan, Textile Manufacturing Student

The establishment of a Cotton Ginning Laboratory was authorized when Congress included $100,000 for such purposes in the Agricultural Appropriation Bill. The late Senator Maybank sponsored the $100,000 provision with an understanding that the laboratory would be placed in this state.

In selecting Clemson for the laboratory, the Agriculture Department emphasized its central location for service to all the southeastern cotton growing states. A land-grant college location was selected because this provides opportunity to unite the ginning research with the related studies of cotton.

Other advantages of a land-grant college location are: available library facilities, opportunity for advancement of staff personnel, and consultation with workers in related fields.

It is toward solution of ginning problems of the southeast as they are related to the mechanization of cotton production operations that work of the new branch laboratory will be directed.

Engineering Advantages

Clemson being centrally located, has a well-established School of Textiles and other facilities for engineering work on cotton production and processing. The professional staffs in these related activities will be immediately available for consultation on problems of the laboratory. Closely related fiber testing and spinning work of the agricultural marketing service of the department are also located at Clemson.

The new laboratory will be operated as a branch of the main U. S. Cotton Ginning Laboratory of the Agricultural Research Service at Stoneville, Mississippi. This laboratory, in operation for more than twenty-five years, has become a world center of research in cotton ginning.

---

TEXTRON SOUTHERN

MANUFACTURING PLANTS LOCATED AT

Charlotte, N. C.
Anderson, Williamston, Honea Path and Belton, S. C.
Hartwell, Ga.

MAIN OFFICE  ANDERSON, S. C.

SIX  THE BOBBIN AND BEAKER
Developed primarily for steam setting the twist in Nylon "Helanca" yarns, this new controlled vacuum-pressure system has a definite place in other types of steam processing. Experimental projects now being conducted by leading woolen and worsted mills are showing such remarkable results, it may indicate the replacement of conventional steam box methods, on the basis of quality alone.

THE PROCESS — More Efficient, More Economical

- Start vacuum pump by means of push button. 22" to 25" vacuum is produced in 2 to 3 minutes. (Pump stops automatically.)
- Steam is injected at controlled temperature for any desired time period. (Steam is expelled automatically.)
- Automatic controls start pump and vacuum cycle is repeated to remove moisture from vessel.
- Pump stops and vacuum relief valve opens to restore atmospheric conditions inside vessel.

THE ADVANTAGES — Higher Quality, Bigger Profits

- Time saving. (Complete process in 30 minutes or less, depending on steam injection cycle required.)
- Positive shrinkage. (Yarn is shrunk and twist is set uniformly from outside to spool core.)

CUSTOM BUILT to customer specifications in accordance with ASME standards, Gaston County autoclaves can be designed with vessels to fit into existing systems using present pin racks and trucks.

RUGGED CONSTRUCTION, always an outstanding feature of Gaston County beam and package dyeing machines, is even more essential in vacuum vessels. Our engineering staff is eminently qualified by experience to design the best equipment for your requirements.

COMPLETELY AUTOMATIC OR MANUAL machines are available. Whether your requirements are large or small we are equipped to serve you. Please phone, write, or wire for complete details.

GASTON COUNTY DYEING MACHINE CO.
Pioneers in Automatically Controlled Dyeing Machines

STANLEY, NORTH CAROLINA

Gaston County Dyeing Machine Co.
Terminal Building, 69 Hudson St.
Hoboken, N. J., G. Lindner, Mgr.

The Rudel Machinery Co., Ltd.
614 St. James St. W., Montreal
137 Wellington St. W., Toronto
This report covers four carefully controlled tests with and without American MonoRail Underframe Cleaners in a mill running on 13.90/1 warp yarn.

Spinning tests extending through 495,742 spindle hours showed 83% less "blow-offs" required with cleaners. This indicated a saving of 60 man-hours per day.

On 66,600 spooler bobbins the test showed 9% reduction of reties for yarn from frames with underframe cleaners.

A slub and gout count covering 16,479 yards of cloth showed 68% increase in average yards per gout.

Also noted in this report was the clean appearance of the spinning room where underframe cleaners operated, requiring less frequent sweeping.

This report can be studied in detail by calling one of our engineers. Let him help you with your cleaning problems.
The Age-Old Question:

Double Creel or Single Creel Spinning

Which is better on the spinning — to run double creel with a high draft, or single creel with a lower draft? There is no question here of changing yarn numbers or hank roving, simply a question of double creel or single creel with the draft necessary to make the original yarn number.

As an illustration, suppose you are now making 2.00 hank roving and making 30's yarn. Which is better to use, double creel with a draft of 30 or single creel with a draft of 15, roving and yarn staying the same in both cases?

We did some work on this at the School of Textiles at Clemson College during the summer of 1954. We used a Model F2 Whitin spinning frame on which we could get a range of drafts from 10 to 60. Two different rovings were run on cotton and one roving on a rayon blend.

One of the cotton rovings was made from Amsak cotton, combed and run into 1.80 hank roving. It was spun into four yarn numbers and in each yarn number two twist multipliers were used. The drafts used were in combinations of 15 and 30 to make 25's yarn, 20 and 40 to make 33's yarn, 25 and 50 to make 41's yarn and 30 and 60 to make 50's yarn. The twist multipliers were 3.00 and 4.00.

The second cotton roving was made from carded cotton made into 1.00 hank roving. The cotton used was Middling color, SLM leaf, 1 1/16 staple, 25% El Paso irrigated, 75% Delta rain grown. The same draft program was used making 14's, 19's, 24's and 29's yarn. Twist multipliers of 3.50 and 4.50 were used.

The third roving was a blend of 50% 3.0 denier, 1 1/2 staple viscose, 35% 1.5 denier, 1 1/2 staple viscose and 15% 3.0 denier, 1 1/2 staple nylon. It was approximately 1.00 hank roving. The same draft program was used except that the draft combinations of 10 and 20 were added in the case of one of the twists. Twist multipliers of 3.25 and 4.25 were used.

One side of a 36 spindle spinning frame was used, this giving 18 bobbins in each test. All of the yarns ran so well that nothing could be learned about ends down. Most of the doffs of 500 yards each never had an end down.

The tests used on all yarns were the skein break, the single strand break, and the Per Cent Mean Linear Unevenness on a Uster tester. Because the results of the Uster Tester, which integrated over a 2 1/2 minute period, showed no difference in uniformity, some of the yarns were run on a Brush tester at 10 yards per minute and an “effective sensitive length” of one foot. Some of the yarns were run on appearance boards, but because no one could tell any difference in the appearance of the yarns, this was discontinued.

In each test the frame was set up for the proper draft with double creel roving. A doff of 500 yards was run. Then one end of roving was broken back and a draft gear with twice as many teeth put on the frame and the single creel doff was run.

The table shows the results of the test. In twenty-three tests out of twenty-five, the low draft, single creel yarn shows the better single strand break. In twenty-two cases out of twenty-five, the single creel shows the better corrected skein break. In none of the other cases is the difference in favor of double creel significant.

This project was conceived and supervised by Gaston Gage, Head, Yarn Manufacturing Department, School of Textiles, Clemson College. It was planned by Gaston Gage and Howard L. Loveless, formerly Assistant Professor, School of Textiles. The project was approved by Dean H. M. Brown. The project was run and the data assembled by Howard L. Loveless, who was paid for running the project by the Sirrine Foundation. This article was written by Gaston Gage. Utica-Mohawk Cotton Mills, Division of J. P. Stevens & Co., Inc., furnished the roving for the carded cotton test and Textron Southern furnished the sliver from which the Rayon blend roving was made.
As stated before, there is no significant difference in uniformity as measured by the Uster Tester. In the four cases where the Brush tester was used to show short term variations, the yarn from single creel roving gave the better results.

As might be expected, it showed all through the test that the higher the drafts, the more the advantages in favor of the single creel, both on the single strand break and the skein break. All of the instances which did not favor single creel were in the low draft range.

Another trend that we cannot explain is that the higher twist multiplier always gave a greater score in favor of the single creel roving. The answer to why this is so may come in some future work.

In conclusion, the results of this test show that under all conditions run on the test, you certainly will do no harm to run spinning single creel with the low draft instead of double creel with the high draft. In practically all cases the yarn will be significantly better and in no cases will it be significantly worse.

The exception to this general conclusion is that in very low drafts and low twists, double creel roving and the higher drafts might be better, especially on rayon and other synthetic fibers where low drafts are apt to be used.

The manufacturing cost as far as the production of roving will be the same because the same hank roving is used in both cases. The number of bobbins to be creelied into the spinning frame will be the same so this cost does not change.

There will be only as much stock tied up in the spinning creels so this should be a saving. It will take about half as many roving bobbins to operate so this should be a saving.

Using a single creel also means a less crowded creel, possibility of larger roving bobbins and easier cleaning.

It is a relatively simple test for any mill to run. If you are now using double creel roving, simply break back one end and put on a twice larger draft gear and compare yarns. If you are now running single creel, set it in double creel and put on half as large draft gear and compare the yarns. This will take care of your peculiar situation.

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### Table: Yarn Quality Comparison

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<td></td>
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<td>336</td>
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<td>336</td>
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<td>18</td>
<td>20</td>
<td>376</td>
<td>336</td>
<td>12.3</td>
</tr>
</tbody>
</table>

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EARNINGS OF TEXTILE GRADUATES
(continued from page 5)

ary information. Of this group, fourteen per cent made more than $20,000, forty-eight per cent made more than $10,000 and 69 per cent more than $8,000 per year during 1953. Table II gives the breakdown by earnings range for this group.

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Number of Graduates</th>
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<tbody>
<tr>
<td>less than $4,000</td>
<td>7</td>
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<td>$10,001 - 10,000</td>
<td>71</td>
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</tr>
<tr>
<td>$15,001 - 15,000</td>
<td>73</td>
<td>23.4</td>
</tr>
<tr>
<td>$20,001 - 20,000</td>
<td>31i</td>
<td>10.2</td>
</tr>
<tr>
<td>over $30,000</td>
<td>21i</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Table II: Earnings in 1953 of Textile Graduates from 1901 through 1940.

Further information is being tabulated on the type of jobs now held by textile graduates. During this phase, the proportion of textile graduates who remain in the textile or a closely allied field will be determined. The proportion of these in line management jobs, staff or technical jobs, and purchasing or sales will also be determined.

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FALL 1954
THIRTEEN
Textile manufacturers are striving to produce their goods at a pre-determined cost and deliver them satisfactorily to the customer. Each mill has its own problems, however, many are similar among the various types of mill operations. In order to be more specific, let us think of a mill making ladies cotton dress goods of different styles and patterns.

Some of the general problems are found in any industry. A summary of the problems would be as follows: (1) securing the baled cotton, (2) planning and controlling the flow of the stock, (3) processing the stock properly, (4) supervision of the personnel, (5) controlling the cost, (6) upkeep of equipment, buildings and machinery and handling of supplies, (7) handling of the payroll and personnel work, (8) keeping necessary records of all the mill activities.

If we try to picture the mill in operation, we can better understand and define these problems. There are hundreds of machines and various equipments. Also these machines will be of various types because of the different processes throughout the plant. Approximately twenty-five different types of machines are used and the number of each depends on the particular process.

The kind of cotton that will make possible the cloth quality desired will be selected. The cotton fibers in the bales will be a definite size suitable for this type of goods. These bales will be secured by dealing with the cotton market. Upon their arrival at the plant they will be checked and stored until needed for processing.

Plans are made to equalize the flow of the stock through the mill so that the cloth order can be filled on a promised date. This will require each phase of the processing to be readied and occupied with the right amount of stock and completed on time. Here we are concerned with changing the baled cotton into yarns and preparing them for the weaving of these yarns into cloth. As I mentioned already, it takes many kinds of machines to handle the stock in changing it to different size yarns from a bale. The movement of the stock from one process to another requires many various types of containers and transport equipment.

Quality work throughout the mill is another daily problem. Both the mechanical and the human element is involved here. Each machine has to be set up to do its work properly. Some will require mechanical changes for making the yarns and cloth according to specifications. Everyone is also concerned with keeping the amount of stock waste to a minimum.

The supervisors have a big job in directing the work of the personnel responsible to them. The duties of each person are explained for the carrying out of the production plans and machine operations. This work, of course, has to be done effectively in order to meet the quality and cost of requirements.

The machinery requires careful daily servicing for keeping it operating properly. Certain repairs will have to be made as needed. Some parts of the machines will require replacement. There are times when new cost-saving machinery will be needed to replace the present machines. The buildings require the usual upkeep, such as painting. Over a period of years, building additions or improvements may be needed.

The purchasing and distribution of supplies is another problem connected very closely to this part of the operation. The keeping on hand and issuing them as needed is another daily task that requires systematic requisitions.
The payroll has to be made every week for each employee to receive their earnings. The information is obtained and the amount determined to be paid each job according to the work performed.

Getting the personnel needed for the jobs and carrying on the services for their individual benefit is also carried out. Some of the individual benefits may be operation of a cafeteria and a medical room, company insurance, a bonus or profit sharing plan, a safety program and deductions from their earnings as social security dues and the like.

Throughout the mill data is recorded daily. These records are kept by the different office personnel. They will be used for many purposes such as supplying the management and supervisors with information. Also, these records will be used within the department and interchanged with others.

Since my job is teaching here in the Clemson Textile School, I will direct my answer to the young people of the industry and the student, past, present, and those of the future. They are handled by men that have acquired the experience and knowledge necessary to analyze. These men have developed their minds to think logically after many years of effective study. Now everyone recognizes the importance of study to train the mind to think profitably. The biggest problem of a teacher is to get the student not to just memorize facts, but use them as a basis for theoretical analysis. Maybe the student thinks the teacher is being dogmatic to give a question that requires some special thought. It requires time to develop the mind to analyze, therefore, one should consider this at an early age or in the case of a college student, at least upon entering the institution.

Several years ago, Mr. A. B. Sibley, Vice President of Judson Mills, one of the Deering-Milliken Mills, stated in the Clemson Textile School Student Magazine that there were more good jobs than good men. I believe the ability to think is one of the top requirements to qualify as a good man. Certainly one that can determine the best solution to the problem at hand, whether it be large or small.
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