1952

The Bobbin and Beaker Vol. 11 No. 2

Clemson University

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University, Clemson, "The Bobbin and Beaker Vol. 11 No. 2" (1952). Bobbin and Beaker. 162.
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- Rim-protected by a tough, tight-fitting steel tire.

RESULT: The lightest, strongest, most durable WARPER BEAM HEADS ever made.
**Tops for Textiles**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VATROLITE®</td>
<td>Use this powerful concentrated reducing agent for brighter vat dyed colors on cotton, linen and rayon... for faster, cleaner stripping results on silk, cotton and rayon.</td>
</tr>
<tr>
<td>DISCOLITE®</td>
<td>A concentrated reducing agent, highly stable at high temperatures, outstanding for discharge and vat color printing. Employed successfully wherever the reducing agent must dry into the fabric and retain its reducing power.</td>
</tr>
<tr>
<td>PAROLITE®</td>
<td>A dust-free white crystalline reducing agent. Soluble, colorless, excellent for stripping wool, wool rags, shoddy acetate or Nylon fabric.</td>
</tr>
<tr>
<td>CASTROLITE®</td>
<td>A highly sulphonated castor oil used as a staple penetrant for dyeing or bleaching in leading textile mills.</td>
</tr>
<tr>
<td>NEOZYMES®</td>
<td>Concentrated low temperature desizing enzyme. Removes starch and gelatine. Excellent for eliminating thickeners from printed goods at low temperatures.</td>
</tr>
<tr>
<td>NEOZYMES® HT</td>
<td>Concentrated high temperature desizing enzyme. Removes both starch and gelatine. Suitable for continuous pad-steam method. Remarkable stability at very high temperatures.</td>
</tr>
<tr>
<td>NEOZYMES® L &amp; NEOZYMES® L Conc.</td>
<td>Liquid desizing enzymes in two degrees of concentration. Remarkable stability at very high temperatures.</td>
</tr>
<tr>
<td>VELVORAY®</td>
<td>A blend of vegetable oils and selected fats for a superior, non-foaming finishing oil. High in combined SO3 and stability. Excellent for sanforizing, will not smoke off at high temperatures.</td>
</tr>
<tr>
<td>VELVO SOFTENERS #25 &amp; #50</td>
<td>Economical creamy white paste softeners derived from highly sulphonated tallow. Give softness and body without stiffness or affecting whites.</td>
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<td>VELVORAY®</td>
<td>Economical creamy white paste softeners derived from highly sulphonated tallow. Give softness and body without stiffness or affecting whites.</td>
</tr>
<tr>
<td>DRYTEX®</td>
<td>A high-test wax emulsion type water repellent finish having extreme stability both in the barrel and in diluted form as used. Non-foaming.</td>
</tr>
<tr>
<td>DISPERSE®</td>
<td>Effective retardant for dyeing vat colors, dispersing and leveling qualities, for dyeing naphthol and vat colors, useful in wool and acetate dyeing. Valuable auxiliary in stripping vat colors, naphthols.</td>
</tr>
<tr>
<td>NEOWET®</td>
<td>Permits effective wetting at all temperatures—particularly useful with enzymatic desizing agents. No reaction to soft or hard water. Not affected by either acid or alkaline chemicals. Non-ionic.</td>
</tr>
</tbody>
</table>

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Bobbin and Beaker
Official Student Publication
Clemson Textile School

VOL. 11 SPRING 1952-1953 NO. 2

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Address: The Bobbin and Beaker, P.O. Box 542, Clemson, S. C.

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 College School of Textiles.

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 friend of mine once said, "Why don't they leave engraving off watch wheels to sell them cheaper? The engraving on the works does not make the watch run any better."

I asked him if he thought the craftsmen making watches would put in as high quality workmanship if they were told that the engraving would be left off so the watches could be sold at a lower price. He paused a little then agreed they would probably at once use less care in making the high precision parts, so that possibly the engraving on the works does make watches run better.

I have visited many textile mills that were proud of their good "housekeeping." Racks of yarn spools would be equally spaced in straight rows even though they might be moved the next hour. At first
thought one would wonder why keeping the yarn racks exactly in line would make better fabrics or be worth the extra care in placing the racks. But progressive administrators are learning that having good housekeeping results in the workers using more care in all the operations that really count in producing a quality product. The Mills are learning that only if the workers can be proud of their plant will they make really praise worthy products.

Not only does the whole operation make more profits when time is taken for keeping a plant clean and orderly but aside from profits good housekeeping results in more joy of work, more good will and better morale throughout the mill. In other words, I guess yarn will run better if the racks are kept straight.

Hance Receives Position
With The Textile Institute

Roger Milliken, Chairman of the Board of Trustees of the Institute of Textile Technology, today announced the election of Dr. L. H. Hance as the Executive Vice-President of the Institute effective immediately and as President-Elect to succeed Dr. J. L. Vaughan who has been on leave of absence for the past two years from the University of Virginia and will resume his duties there on September 1.

Born in Lancaster, South Carolina, Dr. Hance has had textile experience in mills and has been educated in textile institutions. He was graduated from Clemson College with high honors and became a member of the faculty of his alma mater.

Later he attended the Institute of Textile Technology, receiving both the M.S. and Ph.D. degrees.

Upon completion of his graduate training, he was appointed to the staff of the Institute of Textile Technology as a Research Associate. He then was appointed Chairman of the Committee on Academic Studies and recently Assistant Technical Director.

During World War II, Dr. Hance served for thirty-four months in the Infantry, rising from private to the rank of captain.

He is a member of Phi Kappa Phi, holder of the Norris Medal for distinguished scholarship at Clemson College, Phi Psi, Alpha Phi Omega, Phi Eta Sigma, and Tiger Brotherhood.

Dr. Hance is also well known among educators, being a member of the National Council of Textile School Deans, Conference of Deans of Southern Graduate Schools, and the American Society for Engineering Education.

He is active in church work and is now serving on the Board of Deacons of the University Baptist Church.

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Quartermaster Corps "Acid Test"

Lt. Col. Robert L. Harlee

Our country is proud of what we have chosen to call "the American standard of living." Through the Quartermaster Corps, the Army has sought to provide the military equivalent of that high standard to our men in service. To maintain this standard, the Quartermaster Corps procures tremendous quantities of superior textiles and is one of the largest buyers in this field. This buying has been a great support to the cotton farmer and to the textile industry of the South.

Quartermaster Corps Research and Development has as its major function the continual development and testing of textiles and other end items which compose the clothing and equipage of the United States soldier. The Quartermaster Board plays one of the most important roles in Research and Development in that it is the chief field testing agency for The Quartermaster General. Through field tests the Quartermaster Board supplies the vital answer as to the success of this development work.

The Quartermaster Board was established in 1934 as a part of the Quartermaster School in Philadelphia. In 1941 the Board was separated from the School and assumed its present duties at Fort Lee, Virginia. During World War II it achieved the distinction of being awarded the Meritorious Unit Citation three times.

Laboratory work is not part of the Quartermaster Board function. We do not directly initiate the development of new items, but results of Board tests aid in the development of experimental clothing and equipment and point the way for their improvement.

Field testing has many ramifications, but its foremost purpose is to determine whether new developments, depending on their nature, enhance the fighting efficiency of the soldier or improve the operational tasks of the Army. With respect to clothing, the criterion is: "Make it light and durable, consistent with functional suitability." If the weather is hot, we try to make him cooler; if it is cold, we try to keep him warm, but, at the same time, prevent overheating. This is a never-ending task, as perfection is a difficult goal.

New ideas and modifications of old ones are nurtured in the Research and Development Division of the Office of the Quartermaster General in Washington. Industry is one of the greatest sources of new developments. Without this great potential, much of the success which the U.S. Army has known in outfitting its soldiers to combat the elements as well as the enemy would never have been realized.

Once a development has been placed in the research and development mill, such things as cost, production facilities, raw material availability, etc., are considered. If these tests are passed successfully and if the development so lends itself, laboratory tests may be in order. The laboratory has its place in the sun in research and development, but field

SIX
testing is the final convencer. If the item performs well while being worn or used by the soldier engaged in realistic activities, a major hurdle has been crossed. If it does not, additional development must take place or a new angle of approach must be attempted in research.

Scientific field testing as conducted by the Quartermaster Board serves to reduce the time it takes to obtain the answer, whether an item is good or bad. This stretches the research dollar and makes research and development funds go farther. However, most important to the taxpayer, realistic field testing enables putting the taxpayer’s dollar to the best use. Prior to committing a contract, it is known that the new development will perform in the field. Thus, precious dollars are not wasted on useless procurement.

Over a period of years, the Quartermaster Board has developed testing techniques which have resolved themselves into three major categories: Accelerated Control Tests; Normal Use Tests at U.S. Posts, Camps and Stations; and Environmental Field Tests.

Accelerated control tests are conducted on the various test facilities located at the Quartermaster Board. These include a Combat Course, Shoe Track, Rain Course and Glove Course. A great deal of study has been done in designing these facilities for specific tests and to correlate with field results. Fabrics of blended fibers, varying staple length, various twists, different finishes, etc., are tested on the Combat Course and results obtained in a matter of days or weeks. If the test requires rainfall, the Rain Course is brought into action. The rate of rainfall can be controlled at 0.1”, 1” and 3” an hour. Concurrent with tests for water repellency, clothing and footwear can be tested for durability and functional suitability utilizing a combat course or shoe track built into the rain testing facility. Experimental gloves can be worn out in a matter of days on the Glove Course, performing such activities as punching a bag, handling bricks, loading operations, etc. Footwear takes a tremendous beating on the Board’s Shoe Track designed to test the soles and uppers of various types of shoes and boots.

The Products Testing and Survey Divisions share the following two categories of tests. These are the two test sections of the Quartermaster Board, and it is their responsibility to perform the many tests assigned. The Survey Division carries out studies which involve soldier acceptance of various rations and food stuffs, packaging methods and procedural surveys, psychological performance, etc. The Products Division limits itself to end product testing, as (continued on page twenty-three)
THE FUTURE OF THE TEXTILE INDUSTRY AND
HOW IT WILL AFFECT TEXTILE EDUCATION

(Editor’s note: The following is the speech presented by Mr. J. McConnell at the National Council of Textile School Deans Meeting in Boston on November 11, 1932.)

The subject that we are to discuss today on this page is certainly a very interesting one to me. I have been associated with the cotton textile industry continuously for forty-five years, I have seen it shrink from thirty-four million cotton spindles in 1924 to its present size of approximately twenty-four million spindles operating on cotton and man made fibers, yet today cotton consumption and production alone is nearly 80% greater than it was in 1924.

Last year the Textile World published a booklet, which you may have read, that had some very interesting information about the Textile Industry and the following is taken from this booklet. Textile manufacturing is one of the world’s largest industries. In the United States alone it employs a million and a quarter people.

Among the twenty industries listed in the latest U.S. Census of Manufacturers (1947) the textile industry ranks

2nd in number of production and related employees
2nd in number of plants having over 100 employees each
3rd in total number of employees
5th in value added to raw material by manufacture
5th in wages and salaries paid

Still quoting, the value of its products nearly trebled from 1939 to 1947, rising from $4 billion to $11 billion.

Further increases in value from 1947 to 1950 brought this value to 15 billion dollars.

From 1945 to 1950 according to estimates $221/2 billion was spent for new machinery, other major equipment, and new buildings. In 1950 the total amount of money expended for capital and operating expenses was about $8 billion.

So my friends paraphrasing an old saying a little “we are connected with no mean industry.”

Although on this panel I am supposed to represent the Textile Machinery Manufacturers, I hope the other members will forgive me if I invade their fields. I am intensely interested in every phase of the industry. Most of my working life was spent in the mill end of the business, beginning in 1907 and ending in 1935. Since 1935 I have been connected with the machinery manufacturing section. During my mill years I saw the birth of the Textile Engineering Consultants and the beginning of real Textile Research and have been privileged to have rather close contacts with both of these important segments of the industry.

To discuss the probable future of the textile industry and to try to evaluate what effect it will have on textile education, it will be necessary to review the past because after all the only safe basis to work from is to assume that certain changes which have been brought about in the past in the way of improved methods of manufacture and research will when similar situations are presented occur in the future with this addition, the changes and improvements will be adopted more readily and put into effect at a much more accelerated rate.

There are many question marks along the road to the future of the Textile Industry. One of the most important is

“To what degree will man made fibers affect the industry?” To answer this question intelligently, let’s see what has happened in fibers for the past thirteen years.

Going back to 1939 we find the total poundage of all fibers produced was four and a half billion pounds. Divided among the different fibers as follows

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>80%</td>
</tr>
<tr>
<td>Silk</td>
<td>1%</td>
</tr>
<tr>
<td>Wool</td>
<td>9%</td>
</tr>
<tr>
<td>Man Made</td>
<td>10%</td>
</tr>
</tbody>
</table>

In 1950, the total poundage of all fibers produced was 6 billion, 700 million pounds. Divided as follows

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>69.4%</td>
</tr>
<tr>
<td>Silk</td>
<td>0.1%</td>
</tr>
<tr>
<td>Wool</td>
<td>9.1%</td>
</tr>
<tr>
<td>Man Made</td>
<td>21.3%</td>
</tr>
</tbody>
</table>

These figures show that total consumption per capita of all fibers increased from 31 pounds per capita to 41 or approximately 30-1/3% in this period. While man made fibers made a tremendous increase, it is interesting to note that the use of all fibers increased per capita with the exception of silk. The increases were as follows

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>10%</td>
</tr>
<tr>
<td>Wool</td>
<td>50%</td>
</tr>
<tr>
<td>Man Made</td>
<td>193%</td>
</tr>
</tbody>
</table>

In connection with man made fibers, the new fibers, Nylon, Orlon, Daeron, Acrilan, Seran, Xs1, Dynel, Vinyon and others will in all probability have a great influence on the industry but at the moment it is impossible to foresee to what extent these fibers will be produced and to what degree they will be accepted. However without question they will be produced increasingly in the near future as new plants now being built get under way.

(continued on page seventeen)
Riegel has a world of wonderful new synthetic fabrics . . . acetates, rayons and miracle blends. There are rich nubs, flannels and shantung weaves . . . gabardines that are truly washable by hand or machine . . .
new checks, two-tones and solid shades galore . . . fabrics for slacks, for shirtings and for all sportswear. There is such an abundance of variety and value that many leaders in men's wear and boys' wear now style their lines around Riegel synthetic fabrics.
Work Load Determination

R. G. Carson, Jr.

More and more textile plant managers are realizing the value of a good Industrial Engineering department staffed by competent, well trained men. The main function of this department is to develop better work methods and set work loads. If wage incentives are used, the department is charged with designing the incentive plans and setting the work loads to fit plans.

The department may also perform a variety of other duties, ranging from statistical control to general trouble shooting, so it is an excellent training ground for potential supervisors. However, methods study, time study, and wage incentive plans remain the primary function of such a department. These three items are closely related. Too often, unscrupulous people have set work loads with little or no consideration for the people on the job. Untrained people have set work loads without sufficient knowledge of the facts of the job. Later, piece rates were arbitrarily adjusted to bring earnings into line with some pre-conceived amount. It is little wonder that the work of the Industrial Engineering department is often accepted with little enthusiasm.

A good methods and time study program should proceed along these lines:

1. The machine tender, second hand, overseer and industrial engineer should work together to develop the best method of performing the job. This should be a cooperative venture, not the results of the industrial engineer's work alone.

2. The best method should be adopted as the standard method. A complete record must be obtained of this method. Motion study charts and pre-determined time systems can be used to good advantage not only to develop the new method but also to record the method.

3. All operators are trained to follow the standard method. This often involves re-training people who have strong work habits to overcome. This takes time. If piece rates or other form of incentive payment are involved, guaranteed average earnings or other fair remuneration must be paid during the retraining period to protect the operator from a loss of earnings. He can't be expected to pay for his own training.

4. The time it should take for a well trained operator to perform the job is determined. This can be done through a time study of the job or through the use of such systems of pre-determined data as Basic Motion Time Study or Methods Time Measurement. At the present time, most mills establish their standards by means of stop watch time study. A time study is taken of each operator on the operation, even if some of the time studies are brief. This provides a good check on the operator training carried out in the previous step, and also aids in later "selling" the work load. The standard time for the job is computed from the time study data. Of course, personal time, fatigue and delay allowances are included in the standard time.

5. The standard time for the job is explained to the superintendent, overseer and second hands. They should all understand and agree to the resulting work load. After this, the time standard and the resulting work load is explained to the operators. This step is essential. It is usually done by means of a meeting, during which the industrial engineer goes (continued on page fourteen)

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THE BOBBIN AND BEAKER
New Professors

By T. F. Kennett '53

PROF. ROSCOE BREAZEALE

A new face in the textile department is that of Professor Breazeale, who is professor of textile chemistry. Last semester was the beginning of professor Breazeale's teaching career here at Clemson College, but he has already distinguished himself among the students.

Professor Breazeale was born at Pickens, S. C., and attended and graduated from high school there. Mr. Breazeale spent two years at Mars Hill College, upon graduation from high school, and then went on to Duke University. He later attended the University of South Carolina where he received his B.S. and M. S. degrees in chemistry.

Mr. Breazeale spent one and a half years in the army where he held the rank of private. He then attended O.C.S. and received his commission as a 2nd Lieutenant. He received his commission in chemical warfare service and was assigned to the Air Force as a chemical staff officer. He served in the Air Force for four years and reached the rank of Captain, which he held at the time of his discharge.

Mr. Breazeale served with the Continental Chemical Co., where he did production work for one year. His next industrial experience was with the American Enka Corporation of Asheville, N. C., where he served for two years as a research chemist.

He is married and has one son. His favorite hobby is hiking and he is very interested in Boy Scout work. He is a member of the Presbyterian Church and also belongs to the Masonic Lodge, where he is a 32nd degree Mason. He belongs to the American Chemical Society and The American Legion. He is also a member of the Air Force Reserves where he holds the rank of Captain.

Professor Breazeale is well liked by the students and we wish him much success here at Clemson.

PROF. ROBERT CARSON

One of the most interesting personalities found in the textile department of Clemson is Professor Robert G. Carson. Professor Carson is well known to most textile students as “Sunset” and is at present the professor of time study.

Professor Carson was born in Orangeburg, S. C., in 1919, and finished grade and high school there. Upon graduation from high school, Professor Carson entered Clemson College where he graduated in 1939, receiving a B.S. degree in Weaving and Design. He was very active in the textile school and was a member of the Phi Psi Fraternity while here.

(continued on page twenty-three)
Mr. Wray was born in Sandersville, Ga., and attended high school in Elberton, Ga. Upon his graduation from Elberton High School in 1934, he entered Clemson College. Mr. Wray had been enrolled at Clemson for two years when, in June, 1936, he accepted a position as Junior Scientific Aid in the U.S.D.A. Cotton Spinning Research Laboratory at Clemson.

He re-entered Clemson College in September, 1938. His extra-curricular activities included membership in The Blue Key, Phi Psi Fraternity, The Tiger Brotherhood, and the Senior Platoon. Aside from these many activities, he found time to hold the position as Editor-In-Chief of Taps, and hold a position on the Cadet Brigade staff.

Mr. Wray received a Bachelor of Science degree in Textile Engineering in June, 1940. Shortly thereafter, he was called into active service with the U.S. Army. He served for a period of four and one-half years, attaining the rank of Captain. During this time, Mr. Wray served in Australia, New Guinea, and in the Office of the Quartermaster General at Washington, D.C.

After his discharge in 1945, Mr. Wray accepted a position with Dan River Mills in Danville, Va. He rose to the position of Night Superintendent of Number 1 and 2 Mills. While in Danville, he attended and served as instructor on quite a number of courses, such as Foremanship and Industrial Management.

In 1947, he moved to Scotdale, Ga., where he became Superintendent of Georgia Duck and Cordage Mill.

In June, 1949, Mr. Wray returned to Clemson to serve in the Textile Management Department. During the summer months, he has been working toward a Master of Science degree at Georgia Institute of Technology. Mr. Wray is married and has a son, age eleven months. He is a Steward in the Clemson Methodist Church. He is a 32nd Degree Mason and a Shriner. Among his hobbies are: Fishing, Reading, and giving as much time as possible toward rearing his new son.

Mr. Marvin was born September 27, 1919, in Colleton County, but spent most of his childhood in Beaufort County, where he attended Beaufort High School. He graduated from Beaufort High School in 1936.

(continued on page twenty-three)
Teaching Yarn Manufacture at Clemson

By Gaston Gage. Head, Carding and Spinning Department

We have many visitors to the School of Textiles at Clemson. One of the most commonly asked questions is "are you teaching a course in the processing of man made fibers?" In the particular case of the Yarn Manufacturing Department, this means processing these fibers from the raw material into yarn.

The exact answer to the question is "no". We have no course that goes by this title. But we do teach the processing of man made staple fibers in all the yarn manufacturing courses where it applies.

"Staple fiber" is the name given to these synthetic fibers which are spun into yarn. The fiber is originally manufactured into continuous filament. When it is processed in this form it is called filament "rayon" or whatever kind of fiber it may be. Fabrics made from this filament fiber have a slick, smooth look and feel because of the absence of exposed fiber ends.

To get a softer look and feel to the fabric, this filament is cut into short lengths and spun into yarn, using the cotton system of yarn manufacturing. This gives the exposed fiber ends.

In the beginning, the fiber length used approximated that of cotton, with the intention of spinning it on cotton machinery. It was soon evident that a longer staple was desirable. This led to the length of 1½ inches because this was the longest staple that most cotton processing machinery would accommodate.

As time passed it became desirable to use longer staple lengths to make possible the spinning of coarser deniers to get the desired "hand" or feel. This change required machinery where the drafting rolls could be spread wider to accommodate this longer staple. This spreading went on to take staple lengths up to four inches.

The next logical step was to use this same system to process worsteds as the staple length here is from four to five inches.

On the roving frames and spinning frames designed to process these longer staples, the machine from the drafting rolls down to the floor is identical with any cotton roving frame or spinning frame of the same make.

The spindle drives are the same, the twisting arrangement is the same and the builder motion is the same.

Therefore, since we are using practically the same machines and same principles, with minor adjustments, to process synthetic fibers, wool and cotton, we include all these in the same course in spinning and in the same course in roving frames, merely calling attention to the peculiar requirements of each fiber. To do otherwise would lead to endless duplication.

When these different fibers are blended with each other—as is so often done—there is no way to teach their processing separately, the course in spinning must necessarily be all inclusive.

In the course that deals with cards and drawing frames we simply include the pin drafter and roller top card in the machines used.

The principle of the pin drafter and its use falls in the same processing spot as the drawing frame. It is covered in the course along with the drawing frame.

Both cotton and man made fibers are run on the revolving flat card. Its use with these fibers is taught along with its use in the case of cotton. For the longer staples we teach the principle of the roller top card and where it differs from the flat top card.

Our first course in yarn manufacturing is entitled, "Opening, Blending, and Cleaning." Of course the man made fibers do not have to be cleaned. They do have to be opened and blended.

We cover the different problems faced in connection with the opening of cotton and the opening of the synthetic fibers. In most cases, some machines are connected to both problems.

In blending, much of the same system is used for blending different bales of cotton and different kinds of fibers, so blending, in all its ramifications, is taken up in this course. The application and results of this blending is touched on in the appropriate places in subsequent courses.

In view of the above we do not feel that a separate course on yarn manufacturing for man made fibers and worsted is either necessary or desirable, but that the subject matter can be covered best by teaching the courses as processes, covering all fibers as we go.

In the first semester of 1952 we had in the process of manufacture in the yarn manufacturing department the following materials:

1. Combed cotton
2. Carded cotton
3. Blend, viscose 50%, cotton 50%
4. Blend 50% 3 denier 1 9/16" viscose and 50% 3 denier 1 9/16" acetate
5. Blend 75% 1.5 denier 1 1/2" viscose and 25% 1.5 denier 1 1/2" nylon
6. Blend 50% 1.5 denier 1 1/2" viscose and 50% 1.5 denier 1 1/2" acetate

(continued on page nineteen)
over the completed rate sheet in detail. Questions about the procedure and calculations are encouraged. Each operator should understand exactly what is expected of him. If an incentive plan is involved, he should know exactly how an increase in production will affect his pay. The operator should be encouraged to go to his supervisor with additional questions if he thinks of something later that he doesn't understand. The full explanation of the rate sheet should be given to the operators on each shift.

6. A member of the standards department should be on the floor of the department the first day or two the new work loads are put into effect. He should check with each operator toward the end of the shift, and see how the operator did in comparison to expected production or earnings. If things go well the first day, all that is necessary after that are daily spot checks for the next few days. Of course, production and earnings should also be checked daily for the first week or two and more infrequently after that. The job is not complete until the operators are meeting the standard.

The technical aspects of the job are not hard. Most high school graduates can learn to do a competent job of methods and time study. The really important part is the human relations. Too often, (more so in the past than now, I'm glad to report) the work load is computed by the industrial engineering department and passed on to the overseer and the payroll department with no attempt by anyone to see that the operator understands what is expected of him or why. Sometimes the operators are not using the method on which the workload is set, and no attempt is made to teach them this method. Evidently, the management expects the operator to learn it for himself and if he does not that's just his hard luck. Unfortunately, it is also the hard luck of the management. The company loses too when an employee is dissatisfied and his earnings are lower than they should be because he doesn't know how to perform his job. Besides losing the good will and sometimes the services of a good employee, management loses the savings in overhead resulting from more productivity per employee and machine hour.

Training should start at the top. The vice-president or the general manager in charge of production do not need to know how to set work loads, but they do need to know what can be expected from a program like that outlined above. They need to believe in the merit of using the right approach. Other levels of management, particularly overseers, shift foremen, and second hands, should be given a course in methods improvement, time study, and wage incentives. This can be done in night classes, or in classes during the shift. It may have to be done twice, so that all supervisors won't be pulled off the job at the same time. About 20 to 25 hours, in two hours sessions, should be enough to get the basic principles across. This is followed up by the continuous training that goes on during the meetings used to explain specific work loads to the supervisors. If an employee has a question about the work load, he is likely to go to his second hand with it first. If the second hand understands the rate sheet, and can answer the question satisfactorily, he increases the employee's confidence in the fairness of the work load. Of course, some questions may have to be referred to the standards department, either directly or by means of the second hand finding the answer and taking it back to the employee.

Work simplification or general methods improvement principles, can be carried even lower in the organization through short courses. Loom fixers, section hands, and machine tenders can benefit from work simplification training. Posters and employee publications can be used to carry work simplification to all employees.

Because methods and time study procedures have been too often abused in the past, certain specific guarantees should be made to the operators. These are:

1. No operator will be thrown out of work as a result of methods and time study. This guarantee can be met by placing displaced persons on other jobs in the plant. If there are none open, create a job until something does come open. Even the best plants have some turnover, and this will soon provide openings for the extra people.

2. Time standards are guaranteed against change for as long as conditions remain the same. If the method, materials, or machine is changed, change only the affected part of the standard. Make no change regardless of how high earnings may go unless the job conditions change.

3. Payment will be made for downtime or non-productive time during the day beyond the control of the operator. This is usually at base pay if the operator has no other work to do. The operator is usually paid at past average earnings for work on such off standard jobs as sample developments or unusually bad material.

This program is no substitute for good management or good supervisors, but in fact calls for supervisors of a higher caliber. It should, however, result in lower cost per pound produced higher earnings for the operator better machine utilization better employee morale through more equitable work loads and earnings.

All this can be accomplished with no loss in quality if the program is carefully planned and fairly administered.

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DECATURE ILLINOIS
THE FUTURE OF THE TEXTILE INDUSTRY AND
HOW IT WILL AFFECT TEXTILE EDUCATION
(continued from page eight)

In the past few years we have seen Nylon, Orlon
and Dacron in combinations of blends with other
man made fibers enter the men's suiting field in
a large way and in the past year there have been new
combinations of these fibers with wool made into
fabrics for men's suiting where the wool content
has been approximately 50% and according to re-
ports, sales have been so large that mills are no longer
offering these fabrics to the cutters because of the
impossibility of getting enough of these fibers to
meet the demand. These pure synthetics are so new
and there has been so little experience with them it
is not possible to estimate ultimate consumer desire
or acceptance at this time but from present indica-
tions they will play an important part in the textiles
of the future.

However looking over the whole field of man made
fibers and remembering that the production of ray-
on and other man made fibers in this country has
increased from 20 million pounds in 1920 to one and
a quarter billion pounds in 1950, it is doubtful if these
fibers will affect the industry of the future to any
greater degree than they have in the past fifteen
years.

Comparing all the fibers, cotton is still King with
production and consumption of 4 billion, 680 million
pounds annually; man made fibers are next with a
billion and a quarter pounds; wool with 636 million
and silk with only 8.4 million pounds.

These are 1950 figures and very close to our pres-
ent production and consumption.

The next question mark is,
“What effect will design changes of machinery and
new types of equipment have on the future of the
industry?”

The past twenty-five years have seen very radical
changes and improvements in machine design. While
the automatic loom came in at the beginning of the
century, it was not until the 1920s that the possi-
bilities of economy of operation began to be realized.
The Barber-Colman Spooler and Warper were being
offered to the trade at about the end of World War I
and these two machines practically revolutionized
Spooling and Warping.

These major developments were followed rapidly
by Long Draft Spinning and Roving and by One
Process Pickers, each another fundamental improve-
ment which in turn were followed by refinements
in design and manufacturing which have resulted in
greatly increased spindle speeds, loom speeds, with
corresponding increase of production and improve-
ment in quality.

During this period the high quality, high produc-
tion combers were developed.

Also in the latter part of this period we have been
passing through, the American System of Roving
and Spinning was designed to handle the longer man
made fibers and worsted fibers. This system marks
an important change in the processing of worsted
yarns. In the past ten years approximately 15% of
worsted yarn production has been changed from
Bradford and French Systems to the American. Here
in the machinery field just as in the fiber field we
can see nothing radically or fundamentally new in
sight that will affect the industry any more in the
future than it has been affected in the past twenty
years by the improvements and developments in
that period.

The next question is,
“What effect is research going to have on the fu-
ture of the industry?”

Research has been a much abused term, in fact
only a few years back almost any room set apart in
a mill was termed a laboratory or a testing depart-
ment or a Research Department.

Real Research Departments in connection with
textile mills and textile machinery shops are com-
paratively new.

Many of the larger mill organizations today have
splendid research departments, well organized and
equipped. While a certain amount of mechanical re-
search is being done by these organizations, the prin-
ciple field for their research is in the lines of the
textile products being produced by the sponsoring
company.

A certain amount of pure research is being done
in Research Units of this type but the potential pos-
sibilities of organizations like the Institute of Tex-
tile Technology at Charlottesville and the Textile Re-
search Institute at Princeton for Pure Research are
beyond any present calculation. From these Insti-
tutes should come information of great value to the
total textile industry. The Southern Research Lab-
oratory at New Orleans has already contributed a
great many things to the Industry and with its won-
derful equipment and fine organization should be of
increasing and great help.

The Rayon and Acetate industries are the great ex-
amples in textiles of the value of scientific research
and probably were influential in causing the older
lines of the Industry to investigate its possibilities.

The main causes for the delay on the part of tex-
tile mills and machine manufacturers in adopting
scientific research were two. First, lack of interest
or faith in Research, two, lack of funds for Research,
because as we all know it takes a large investment
to provide proper equipment, facilities and organiza-
tions to properly carry on this type of work and the
returns are not evident for a long period of time. In
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THE FUTURE OF THE TEXTILE INDUSTRY AND HOW IT WILL AFFECT TEXTILE EDUCATION

(continued from page seventeen)

defense of the Industry for not adopting research sooner and to a greater degree, the facts are that with few exceptions, mills made very meager profits for a period that covered from 1924 until the Second World War. While we in the old Textile lines including textile machinery manufacturers have not had enough experience in real scientific research to prophesy its effect on the future, without question it will be very great. Organizations like the Institute of Textile Technology, the Research Institute and the Southern Research Laboratory would probably call that statement conservative. These three question marks — Fibers, Machine Development, and Scientific Research plus Labor Relations are the big question marks of the industry. There are smaller ones which in the aggregate may be important but all together they point to one thing. The Textile Industry of the future will be carried on in a much more scientific and efficient manner than in the past.

We have seen in the past generation a great change in the ownership and control of the operating units in the industry. In the old days we saw large organizations like Amoskeag and Pacific operating cotton and woolen and worsted mills with their own dyeing and finishing plants and the Amoskeag even went into building textile machinery but there were not many if any other companies in that era with similar setups.

Today we see the great integrated companies like J. P. Stevens, Deering-Miliken, Berkshire, Burlington Mills, Lowenstein, The United Merchants, The Ely Walker Mills, Pepperell, Cannon, Reeves Bros., Avondale, Cone, West Point, and Springs controlling a big percentage of the industry with what may be called super top managements with outstanding vigorous far looking organizations all the way down the line.

With this picture of the industry, I have tried to present to you in mind, I would like to point out to you gentlemen, the part I think you and the young men who will train under you should play in the carrying on of this great industry.

The men who graduate from your schools and take their places in the industry will, in the future as in the past, play a big part in the business. I was very much impressed by the article in the DAILY NEWS RECORD of the survey of 2000 graduates of Lowell Textile Institute, made by Professor James W. Bell.

The survey showed that 9 of every 10 L. T. I. graduates are still in the textile industry in some branch. Fifty-five alumni are Vice Presidents, 150 are Managers, 73 are Superintendents, 116 have duties as Treasurers, Agents and so on. Most interesting fact is that all but a few of these alumni are employed in Massachusetts and the New England area. Probably every school represented here could point to a similar record and this shows the great responsibility you gentlemen have to train these young men under your supervision so they will have the best preparation possible to carry on and develop this great industry to the fullest extent.

To do this you will need the proper tools. Facing facts and speaking plainly, up until within a comparatively few years, the majority of the Textile Schools in this country have not had adequate buildings, equipment or facilities. In the past few years great strides forward have been made. More money has been appropriated by your state governments, large sums of money have been raised by some of your alumni groups and you have received gifts particularly in this region from foundations like Textron. This money raised by all of these sources has resulted in great strides forward, some of the schools represented here have splendid new buildings, all of your schools have new equipment and some of you have been fortunate enough to benefit from foundations of sufficient size to enable you to pay salaries which will attract more able men to your faculties.

However, in my opinion, a great deal more should be done, more money should be appropriated by the states, more foundations supported by contributions from the textile industry and more groups of alumni should be formed to raise funds along the lines that the North Carolina State Alumni group has done so well. These young men who graduate from your schools and make this industry their life's work are going to need a better and better foundation to prepare them for a more and more competitive industry which will always be a vital part of our country's great economy.

TEACHING YARN MANUFACTURE

(continued from page thirteen)

7. 100% 1.5 denier 1 1/2" viscose
8. Blend, 40% 3 denier 2 1/2" viscose, 40% 3 denier 2 1/2" acetate, 20% 3 denier 3" Vicara
9. 100% viscose 5.5 denier 2 1/2"
10. 100% acetate 5.5 denier 4"
11. Blend 90% worsted, 10% orlon.

Some of these stocks have run out but we expect to start blends and fibers through during this semester. We use the standard mill practice of tinting for identification purposes.

The makers of all these man made fibers have been very liberal with the School of Textiles. They have donated to the school all the fibers that we have used, graciously supplying our every need. This we appreciate.

This article may give the impression that we put all our emphasis on man made fibers. This is far from true. We realize that every time the textile industry uses one pound of staple synthetic fibers it uses above seventeen pounds of cotton.
Plans are being made in the Textile School to conduct a professor rating this semester. All textile students will participate. The poll will be directed towards helping the professors improve their teaching techniques. The poll will be completed around the middle of this semester.

A steak supper was held at Seigler’s Steak House in Walhalla on December 11. A very enjoyable social session followed. Professor R. G. Carson, chairman of the faculty placement committee, conducted an informal discussion at our last meeting to determine what type of placement service would be most effective for our graduates.

New officers for 1953 were elected by Iota chapter on December 18. The newly elected officers are Bennette E. Wilson of Spartanburg, president; George R. Morgan of Greenville, vice-president; Arthur B. Swett of Greenville, secretary-treasurer; John T. Messer of Inman, senior warden; and Ben K. Chreitzberg of Williamston, junior warden. The new officers were installed on January 8 by Professor H. L. Loveless, installing officer, and Prof. W. C. Whitten, installing marshall.

Twenty-six Clemson College seniors have been named to be listed in the 1952-53 edition of “Who’s Who in American Universities and Colleges.” Phi Psi was well represented, having four men named for this honor. Those named were William D. Asnip, Leonard G. Boyd, William P. Creighton, and Marvin Robinson.

The Iota chapter had six seniors to graduate in February and join the ranks of our many Phi Psi alumni. Those graduating were: William D. Asnip, Textile Manufacturing major from Clemson; Leonard G. Boyd, Textile Manufacturing Knitting major from Manson, Iowa; Rodolfo A. David, Textile Manufacturing Knitting major from Guatemala. Central America; Paul S. Monty, Textile Manufacturing major from Charlotte, N. C.; Charles E. Mundy, Textile Manufacturing major from Ware Shoals, S. C.; and Vernon M. Williams, Textile Manufacturing major from Enoree, S. C.
TEMPLES WITHOUT ROLLS
DEVELOPED AT CLEMSON

By Hugh M. Brown
Dean. School of Textiles. Clemson College

(Editor's note: "The two following articles by Dr. Hugh M. Brown were originally published in the October 1952 issue of 'Textile World'."

Cloth that is uniform from selvage to selvage can be woven if our new-type temple is used.

The temple is made from the basic parts of a rayon-type temple with the cap and the rolls removed. The end portion of the temple, where the rolls are recessed at the bottom, is cut off and replaced with a short, flat plate that extends even with the projection underneath the temple.

A clip, similar to a tenter-frame clip, is placed on the cap head. The clip pivots from a pin held by two short stands. A spring holds the clip in the normal holding position, and a lever, is pivoted to the temple from a stud and extends from the clip to the temple-arm housing.

When the lay is located at any position except front center, the clip locks the woven selvage in the temple. When the lay reaches the front center position, the projection at the base of the temple is struck by the lay, the temple is moved back a short distance, the lever strikes the temple-arm housing, the clip is pushed inward against the spring, and the cloth, released from the temple for a moment, is pulled forward.

The spring presses the clip back in its normal holding position when the lay moves backward and the cloth is re-gripped.

If the temple is purposely caused to release the cloth, it re-grips the cloth as soon as the lay reaches the front-center position again.

It seems that this temple will hold any fabric that can be held by gripping only the selvages, and the cloth woven with the temple is uniform in appearance from selvage to selvage.

The clip should compensate for its own wear for a long time.

NEW TYPE LENO DEVICE
DEVELOPED AT CLEMSON

Dr. Hugh M. Brown, Dean

The Clemson School of Textiles has developed a new device which produces leno weaves without the use of doups. The arrangement is worked entirely from a dobby head which makes it possible to intermix, pick by pick, plain weave, ordinary leno, full-turn leno or even more full-turn leno.

The leno action is accomplished by running each pair of warp ends through holes in small pinion gears mounted in a bar behind the harnesses. On each pick the gears are rotated the required number of half turns for the leno desired and stopped with each pair of ends separated horizontally so that the right-hand end in every pair may be either raised or lowered by one special harness, while the left-hand end of each pair may be given the opposite motion by another similar harness.

The rack that rotates the pinions may be operated from two doby levers and the intermixing sequence set up on the pattern chain. Considerable cross stripping effect can be had by intermixing picks of plain weaving, ordinary and full-term leno. The system works well on warp end spacings down to one fourth inch and is especially valuable for locking a weave having very widely spaced picks.

One application would be more economically making fruit and vegetable bagging material by more widely spacing ends and picks.

This device was first conceived by Dr. Hugh M. Brown, Dean of Textiles at Clemson College, and later developed by Mr. Evan A. LaRoche, Assistant Professor of Weaving at Clemson.
Our sincere good wish is

that you and your fellow students will find all of the gratification of achievement in your careers in the textile industries that your studies have made possible.
NEW PROFESSORS
(continued from page eleven)

He worked in the time study Department of Callaway Mills of LaGrange, Ga., from June, 1939, until January 1942. His work was interrupted at this time as he was called into the army where he served as an infantry officer. He spent twenty-six months in India, while in the army, training Chinese Nationalists troops. He received his honorable discharge from the army in March, 1946.

Next Mr. Carson taught at Clemson College from 1947 to 1949, during which time he expanded the time study course from one hour per week to its present status. Then he entered Georgia Tech where he received his M.S. degree in 1950. While at Tech he majored in Industrial Engineering and minored in Labor Relations. He was a member of Alpha Pi Mu, honorary Industrial Engineering Society while at Tech. He also taught half-time at Tech while working for his M. S. degree.

From Georgia Tech he went on to the University of Michigan and finished all his course work for his Ph.D. degree by 1952. He is now awaiting an acceptance of his thesis to obtain the degree. Mr. Carson taught half-time at the university while doing his graduate work.

Mr. Carson is a member of the American Institute of Industrial Engineers and the Society for the Advancement of Management. He is married, has three children and lives in Goodman Apartments on Wigginton Street. He is also and active member of the Methodist Church.

LINTHOUSE PERSONALITIES
(continued from page twelve)

After working on a farm and in a merchantile store for a year, Mr. Marvin entered Clemson College in 1937. During his summers, between semesters at Clemson, Mr. Marvin worked in the spinning and Weaving Departments at Springs Cotton Mills, Fort Mill, S. C. He received a Bachelor of Science degree in Textile Engineering in 1941.

Mr. Marvin entered the U. S. Army in 1941 and received his training at the Medical Center, Camp Lee, Va. He then served as a Medical Technician in a Medical Battalion in the Panama Canal Zone for a year. After this, he was connected with a Medical Company, attached to several task forces in the Southwest Pacific until the summer of 1945.

After his separation from the Army, Mr. Marvin accepted a position with Judson Mills in Greenville, S. C., where he worked in the Standards Department until the summer of 1946.

Mr. Marvin then went to Dan River Mills at Danville, Va., where he worked in Production Control until his return to Clemson in February, 1949.

Mr. Marvin is married and has one baby girl.

QUARTERMASTER CORPS “ACID TEST”
(continued from page seven)

its name implies, although the latest techniques of interview and psychology are utilized to obtain subjective reaction.

If a test requires a specific climatic condition, the Board sends a test team to a desired area whether it be at the North Pole or the Equator. During the past winter test season the Board had teams in Canada, Newfoundland, Alaska and Panama; Fort Dix and Fort Monmouth, New Jersey; Exercise “Snowfall” at Camp Drum, New York; Exercise “Longhorn” in Texas; at the atomic test site, Camp Desert Rock, Nevada; and at the Board’s own winter test site, Mt. Washington, New Hampshire. Last summer a team tested an experimental hot-dry uniform in the deserts of Arizona and California.

Wherever the test may be conducted, test data is studied by the technologist in charge of the test preparatory to writing the report. The technologist primarily responsible for each test has followed its progress throughout, having written the test plan and determined its individual requirements. Test data is analyzed statistically and reviewed meticulously to ascertain its correctness. The analysis section at the Board processes the final report to determine that test objectives have been satisfied based on test findings.

Although the Quartermaster Board is continuously engaged in field tests for the Quartermaster General, an internal program is carried out to improve the facilities and testing techniques employed. Just as industrial and military research never rests, the Board continues to develop its usefulness as a testing agency. Stagnant thought and satisfactory smugness are not by-words of the Quartermaster Board.

Testing clothing and equipment is a technical, tough, gloryless job, but our motto is “We Shall See.” In keeping with this motto, the Quartermaster Board will do its part to see to it that our Army continues to be the best fed, the best clothed and the best equipped Army in the world.

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SPRING 1952-1953

TWENTY-THREE
As The Editor Sees It - - -

By R. R. Fowler '53

"Why don't more students take an interest in extracurricular activities?" This has been the subject of some two or three conversations between a friend of mine, who is a member of the faculty at Clemson, and myself.

In regard to this subject, I would like to leave a few serious thoughts with, not only Textile students, but all Clemson students. Almost every day you, as a student, are exposed to the various fraternities, clubs, socials, and publications here on the campus. Daily you read their meeting calls on the various bulletin boards spotted over the campus. Everyone is familiar with most of these organizations, yet, how many of you take an active part in any of them? Of course, some of these fraternities have certain scholastic requirements that a student must meet before he becomes eligible for membership. Even then, the student must wait for an invitation from the fraternity before he can join it. And yet, there are many organizations, located in almost every school of study, which welcome any student who is interested in the organization and shows his willingness to sacrifice a little time for the organizations.

If an interested student would only take a little time to investigate one of these organizations, perhaps by talking to a friend who is a member, or by attending a meeting of the organization before deciding to become a member (this is permitted in many organizations), he probably would see the aims and purposes of this organization in a very favorable light.

Upon investigation, a student will learn that the work done by these organizations is not work which has to be done by someone. On the contrary, these organizations are not formed in order to give students jobs which have to be done. They are formed in order to give the student an opportunity to do things which he likes and wants to do.

These various organizations serve numerous purposes for their student members. To name a few: they enable him to meet other students and become better acquainted with his friends in the organization; they serve to strengthen a persons' initiative and sense of worth through accomplishment; they enable the student to become better acquainted with the faculty in most instances, which, very often leads to important contacts elsewhere. In any case, they will relieve the student of a certain amount of idle time. Too much idle time is often detrimental to a persons' initiative.

On the lighter side, these organizations are not "all work and no play." Every club has its' socials, banquets, movies, guest speakers, smokers, or just "bull sessions." Club meetings which feature a guest speaker or a good movie are often enjoyable and informative. And I have yet to see a person who failed to have a fine evening while wrapping himself around a good steak supper.

I'm sure that members of the many organizations at Clemson will agree that the time they contributed to these clubs has not been time "spent," but time invested.

HELP!

us to keep our files up to date. If you wish to receive the following issues of THE BOBBIN AND BEAKER, please fill in this form and mail to:

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