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The Bobbin and Beaker
The Official Journal of the Clemson Textile School

VOLUME IV APRIL 1943 NUMBER 2

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Cover Photo of H. H. WILLIS and R. K. EATON by R. G. HUFFORD
DEDICATION

It is with sincere hopes for the safety of two former students of textiles at Clemson College and members of Iota Chapter of Phi Psi who are now listed as “Missing in Action in North Africa” that we dedicate this issue of THE BOBBIN AND BEAKER.

LT. HERVEY H. ROBINSON
TEXTILE ENGINEERING
CLASS OF 1941

LT. ROBERT L. CHEATHAM
TEXTILE CHEMISTRY
CLASS OF 1942
Guest~ Editorial

Planning For Peace

BY W. M. McLAURINE

Secretary and Treasurer, American Cotton Manufacturers Association

There is an old nursery rhyme which reads as follows:

Humpty Dumpty sat on the wall,
Humpty Dumpty had a great fall.
All of the King's horses and all
of the King's men
Can't put Humpty Dumpty back again.

It is said that most of these rhymes had their motivation in some phase of reality. This one could easily have referred to some glamorous and egocentric politician or public leader who sat on the wall listening to the plaudits of his public so intently that he failed to see the lurking assassin stealthily creeping up behind to strike him down.

To bring the story to the point desired to be stressed, he looked too intently in one direction and failed to look around him so that he would know all conditions.

Today there is a magnet so strong in its pull on our minds and hearts and patriotic devotions that we may sit on the wall and see only one side of life with the result that we may later be knocked off of the wall by some unseen force.

The winning of this war is the most mandatory purpose now pervading the minds of men. All activities and desires are spent in attaining this end and yet life with its eternal purposefulness moves on. There will be a peace some day and the problems of peace must be met with as much boldness and resoluteness and purposeful planning as have the problems of war.

The possibilities and problems of war faced this nation long before the actual necessities arrived and yet this nation only talked and talked and argued and dealt with theories and abstractions; finally the awfulness of unpreparedness faced us and stunned us. The work had to be done with dislocations and expense and delay that were disastrous. We are now getting into our stride but the delay has been a factor in lengthening the war beyond what it might have been if we had been prepared.

Humpty Dumpty was too busy with reforms and political experiments and an ignorant belief in his physical isolation to look all around him until the enemy struck its deadly blow. Humpty fell off the wall, but in this case he will be or is back again.

We don't know when the war will end. We believe it will end and that once again the arts and sciences will be invoked in working out a social economy for peace. The greater the action, the greater will be the reaction. No war in history has produced greater action in men and materials. The whole world is topsy-turvy and must finally be brought back to or made to approach some form of political equilibrium.

"Time is running out,"—the end is closer than it once was. The great disturbing force of mankind is economic security. So much of the unusual artificial yet necessary industrial activity will cease or change its motivation when the war ends. What are the industries that will end and how can they be changed into peace time agencies?

Those who continue in their present activities will be influenced by the stoppage of war demands. Who has any idea of how much or what can be done to offset this industrial necessity when it ends. Unemployment was the savage monster that wrecked our economic empire during the last decade.

Science and technology have been exceedingly active in the fields of research. Their findings and plans are silently awaiting an opportunity to sweep out in peace world activities and make themselves manifest.

There will be new machines and new products; new competitions and substitutes, new labor saving gadgets with automatic devices. There will be new industries that will make a place for themselves. There will be a decentralization of industry and likely the South will have its greatest industrial growth in the post-war period. There will be new social, economic and political problems or perhaps it is better to state that these problems will take on new or different meanings.

The pulpit and the pew, the public and the press will be caught up in the confusion of adjustment. The greater the intelligence the less the confusion. I realize that there are no answers to these problems

(Continued On Page 15)
How About Cork?

By L. H. Hance, '44

When Professor William G. Blair began selling covered rolls for the Armstrong Cork Company, the textile industry was not very responsive. At this time the entire industry was going through a period of change in drafting processes. The textile manufacturer wanted a roll that would endure the pressure of long draft, for the leather rolls obviously could not stand up under the strain. The cork roll at this time was not developed to any great extent, and Mr. Blair, as a representative in the Southeast, wanted a cork roll that would take the place of the leather roll and that would endure the long draft.

For many years the cork companies who made stoppers for whisky flasks and druggists bottles, had hunted some means of using the strips of cork from which the stoppers were cut, in an effort to avoid waste. When the idea of using cork covered rolls was presented they saw an easy means of using this surplus cork. They ground the cork and compressed it into a long sheet from which the coverings for the rolls were cut. After years of experimentation the cork rolls still were not perfected. With the introduction of long draft spinning and roving processes the cork companies saw their opportunity. Heretofore in the compression process the cork particles had been pressed together as the scales of a fish. When the roll revolved the projecting particles caught the fibers and caused lap-ups. By changing the direction of compression the cork companies made a roll that did not produce a lap-up and that would endure long drafting processes.

Mr. Blair at the time previous to the boost in the cork industry had tried to get his company to produce a roll that would meet the manufacturers' need. The textile industry was not anxious to change from leather rolls and a long line of custom. Mr. Blair said that in introducing cork rolls to the Southeast he had to overcome the custom of one hundred years.

For nearly four years he endeavored to find a roll, and to present the roll he represented, in order to meet the necessary requirements. As he left the Armstrong Company, the new cork rolls were developed and the cork boom was on! The cork roll and long draft made an excellent combination. The cork roll reduced the hard twist and hard ends that were produced by the leather roll and the long drafting process.

The textile industry was very receptive to cork rolls when the cork companies met their requirements. So many manufacturers liked the new cork rolls that today more than eight million rolls are being used in industry for half of the cotton spindles in America.

"With this sudden popularity of cork rolls," said Mr. Blair, "the leather companies were forced to take steps to prevent their annihilation. They developed their own rolls, selecting better leather and gave it a better processing. The result today is that the leather companies are presenting a better roll for better production to meet the competition of the cork roll."

When we interviewed Mr. Blair in his office on the third floor of the Textile Building, he seemed still optimistic about the future of cork covered rolls. Mr. Blair has been a member of the Clemson faculty for a long time. He came to Clemson after graduating from the New Bedford Textile School. After many years he accepted a job with the Government testing department, and from there he went to the Armstrong Cork Company. He has been assistant professor of Carding and Spinning since he left the Armstrong people. Mr. Blair is credited with presenting the cork roll to the textile industry in the Southeast.

Today the cork industry is finding it somewhat of a problem to meet orders because of the lack of cork and the destruction of many of its sources. Some companies have developed new means of treating the cork from a tree that is only ten years old. In the past it was necessary that the bark of the cork tree be almost twenty years old before it could be used for making rolls. Many people believe that the rapidly developing synthetic covered rolls will possibly make some advances under the present circumstances. The makers of synthetic coverings have been forced to perfect their own rolls also, in meeting the competition brought about by cork rolls.

As to the future of covered rolls, Mr. Blair says, "the changing textile industry will probably bring a still greater change in roll coverings. New devices will bring about new necessities and requirements. There is a great possibility that a plastic roll or a combination of plastic and cork, or some other material yet to be discovered, may prove to be even better than our present rolls."

SOVIETS RAISE BLACK COTTON

Black cotton is a new variety recently originated by Russian plant geneticists. One advantage which this cotton has, together with other varieties with colored lints ranging from red to green, is the eliminating of the dyeing process. It is believed that the natural black will be a faster color than the black of dyed cottons.

American cottons with green and brown lints have been known for some time, but are not grown on a large scale because their yield is considerably lower than the white linted varieties. Our colored cottons are used principally in certain regional handcrafts industries.

Renaissance In Research

BY J. J. McCarthy '43

At last the textile industry has awakened from its slumber! Research is on the move after many years of inactivity. It may be said that this new movement is many years behind time, and that is true. But now we are witnessing action which will bring results to an industry which has, may we say, long neglected itself. Heretofore, research has been associated with such activities as medicine, metals, minerals, chemistry, the automotive industry and others. It appears that the textile industry could find no use for such a thing as research. Perhaps it was because the art of textile manufacturing is so very old that the conventional methods and processes became too firmly embedded in the minds of the men in this industry. It may also have been because the supply of raw materials which are used has never been seriously imperiled. Cotton has always been produced in the same localities and it was never thought that there might be a time when we might have to use different fibers other than cotton and wool. Our chemists began to develop fibers from cellulose, the very thing which is a large constituent of cotton itself! This was the beginning of some serious competition to "king cotton." Continuing their work, the chemists brought about a fiber very similar to wool—composed mainly of protein as is wool itself. This was further competition in progress against our natural fibers. These activities have continued until the present time, and are still in progress. As a result, it is not at all difficult to see what a great place the chemically-created fibers have taken in our textile world. It certainly is high time for "king cotton" to be on the move if he expects to keep up with this fast-moving "synthetic age."

Things are beginning to stir a little and some progress in research is beginning to show in spite of war-time conditions. Even before Pearl Harbor we began to mobilize our forces as the crisis was approaching. We know that textiles are just as important to the war effort as are minerals and metals. This industry's job is to clothe and supply not only the Armed Forces of our Nation but all of our allies. It is now necessary not only to fight for the welfare of the industry itself, but to gear the industry for contributing to the salvation of this great Nation of ours.

The textile industry has done a marvelous job in fulfilling its part of the war effort, as we all know today and it will continue to do so for the duration. However, the job does not end with the peace treaty. Rather, it only begins there. We are not living our whole lives for the prosecution of a war. The war is only a hideous interlude in the progress of a nation at peace. True, it is a job which demands the very utmost attention and effort at present, but it will not last forever. This great United States of America has been made great through the works of her people in a time of peace. It is because of her peace-time development that she is able to meet the almost impossible tasks of war.

Consequently, we must see that it is the future that we have to look to. We certainly can not do anything with the past, it is gone! For the present, we can only use benefits which were afforded us by men in the past. But for the future, the benefits and progress are limited for us only by ourselves, and the happiness of those to come after us depends to a great extent on what we do about it right now. We have heard students here in our textile school at Clemson say, "Oh, what's the use of studying; what's the good in going on?" As Mr. Wigginton of the Cotton-Textile Institute says, we may not be here, but the textile school will be here, and the industry will be here.

What would become of our future citizens if we all took such an attitude? Our point boils down to this—research is going to be a great contributing factor in the future welfare of the textile industry, and the sooner we realize this, the sooner we get busy at it, the better off we will be in our textile world.

The New Orleans Laboratory

Without exception one of the most notable examples of this new and emphatic research program is the New Orleans Laboratory. Its full name is The Southern Regional Research Laboratory of the Department of Agriculture. The building is 211 feet wide in the main section and the two wings are each 368 feet along the sides. It represents an investment of well over $1,463,000. Construction was started in June 1939, and today the whole plant is in full operation. We bring you here parts of the report by the Director of the Laboratory, Dr. D. F. J. Lynch, presented at the annual meeting of the Cotton-Textile Institute last October.

"In assigning commodities to the four regional research laboratories the Department of Agriculture allotted to the Southern Laboratory cotton, sweet potatoes, and peanuts. About 80 per cent of our research effort is directed toward the utilization of cotton and cotton products. For the administration of the research program, our work is divided among seven research divisions. We have one division which works only on sweet potato products, an Analytical, Physical Chemical, and Physical Division which carries on all of our analytical and special physical work; an Engineering and Development Division for carrying new products and processes beyond the laboratory stage; an Oil and Protein Division which concentrates on cottonseed and peanut products; and three divisions which work on cot-

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Zoot Suits--Out Of This World!

BY H. R. VALERIUS, '45

"Out of this world," was a favorite cry of the jitterbugs in zoot suits, but now the government has taken up the cry. The rug-cutters are slated for a little scissor session with Uncle Sam. The cloth in our clothes has to be cut to a minimum. It is easy to see how serious the situation is when cuffs have to be taken off pants, and this action affords a great saving in cloth. It is a waste of cloth and unpatriotic during war-time to produce the full-cut "zoot suit" when it is so necessary to save as much as possible in order to meet the demands of our armed forces, our allies, and essential civilian needs.

The zoot suit might just have been a fad and died out in a year or two, or it might have made a definite impression on the styles of our clothes. It did start to creep into fashion, but the war put an end to it. Textile mills are being converted to an all-out war effort and workers are staying on the job many hours overtime. It is only right that the "zoot suit" advocates go back to pleatless, tuckless, and cuffless clothes for the duration.

We must do away with all excess consumption.

The zoot-suit was originated by Al Capp in his comic strip "Lil Abner." Capp did not attempt to create a different style, but he used the excess amount of cloth in the clothing of his minor characters for contrast. It started nearly five years ago when "Lil Abner," a hillbilly, first visited the big city. "Lil Abner's" suit was too small, the sleeves were short, the pants were short and tight, and all the seams were stretched. Upon reaching the city he saw clothes that were cut full and roomy—to him that was a sign of wealth. The city characters had hats with huge brims and coats that were extra long, with padded shoulders, and very full sleeves. The pants were baggy, but they fit well at the bottom. In general "Lil Abner" saw everyone wearing clothes that were spacious.

The costume was widely adopted by millions of jitterbugs, and it grew so popular that the Washington and Willard Hotels had dances for zoot-suiters only. The place was packed and jammed. News photog-

A Statement By F. S. Blanchard

President, Textile Research Institute

I firmly believe that there never was a time in the textile industry when research has been more important than it is today. We need research and we need it badly to win the war and we need it also if our industry is to win the peace.

New fibers, natural and synthetic, with new ways of treating these fibers—aided by the great achievements of chemistry—are coming rapidly to the forefront. If cotton is going to hold its own in the great competition ahead, it needs to call scientific research to its aid in showing us how to improve it and its performance, perhaps chemically, to modify its qualities, so that it will meet the needs of the war and survive the competition of the peace.

Not only is scientific research needed on the fundamental qualities and structures of the fiber, but we need so-called practical research on what is happening to the fiber during the different processes of manufacture. Some time ago at least one mill with which I was familiar learned a good deal about how to improve the running of the work by processing studies using the aid of photomicrography. On the basis of these studies standards of operation were set which in turn made possible much improved standards of end breakage, loom stoppage, etc. On these standards, in turn, jobs were set up which resulted in great improvements in labor efficiency without increased effort on the part of labor.

It is not unreasonable to believe that similar studies today, if undertaken under the supervision of experienced research men, aided by practical mill executives, would help many mills considerably—even on staple goods—in improving the running of their work. And this is especially important today, when a threatened shortage of labor faces many plants in the industry.
There Will Always Be A Textile Industry

BY PERRIN N. COLLIER,

Vice-President and Director of Research,
Callaway Mills

There will always be a textile industry. The art of weaving was developed early in the history of civilized man. The industrial revolution centered around the textile industry when spinning jennies and power looms displaced the hand work of countless individuals. In the present struggle the textile industry is recognized as being essential to the war effort; with the return of peace it is certain that textiles will be continuously in demand.

Yes, there will always be a textile industry. This can mean that there will always be a COTTON-textile industry. But let me point out a number of instances where a well-established industry has been completely revolutionized. Take the indigo industry. Indigo was at one time collected from plants by thousands of underpaid laborers and in small yield until the Chemist Baeyer, in 1882, synthesized the compound in his laboratory, using coal tar as the source of this material. In the year 1935, as a result of his discovery, over 7,000 tons of synthetic indigo were used in the United States alone. A more recent example is the case of silk which was produced from the cocoon using Japanese laborers whose average wage was a few cents a day. The yield was small and the ultimate cost of the product was high. Now, the synthetic, Nylon, quite adequately fulfills the uses of silk, and natives formerly dependent on the silkworm for a livelihood may as well look for a new occupation. This is true of the rubber industry which will never go back to complete dependence on nature and low-priced labor for its raw material. The emergency has forced us to build synthetics and the natural rubber will have to compete as to price and quality when production is established and peace finally comes, for the course of mass production has always been toward a better product at a constantly decreasing price.

These examples should be sufficient warning that it CAN happen here and that any fiber, whether it be cotton or some other, that is to be used in the textile industry must meet the requirements of physical properties and cost. Cotton is no longer king. Cotton can no longer depend upon its ancient and romantic history for prestige; it must stand on its merits alone.

The Significance of Rayon

Before the year 1920, the American textile industry employed only the natural fibers—cotton primarily, then wool, silk, linen, hemp, and jute. Excluding from consideration hemp and jute, cotton consumption in 1938 was 81% of the total poundage, rayon was 9½, wool 8½, with silk amounting to only 1½% of the total. This lusty newcomer rayon, only recently having attained its majority in the American textile industry, ranks second in the field of total poundage, and its significance is greater than these figures indicate. It has entered the dress goods industry; it dominates the underwear industry; it is being used extensively for hosiery, for sportswear, and even for mechanical fabrics. It affords interesting decorative effects for incorporation into drapery and upholstering. Originally designed as a cheap substitute for silk, its versatility, usefulness, and eventual cheapness has led to competition with cotton in numerous fields, especially since the development of staple fiber.

Adequate production figures are not available on Nylon. It is used in place of silk in parachutes, has achieved a conspicuous success in hosiery, and its ultimate utility appears to be limitless. This product of the test tube in certain characteristics has improved on nature.

Vinyon and its close relative, Saran, are additional contributions of high-polymer chemistry to the textile field. Fabrics from these materials are decorative, waterproof, and resistant to acid and alkali. They are used in insulating materials, in filter fabrics, and in upholstering. When the coming peace releases from strategic war needs the polyvinyl polymers from which these fibers are made it is certain that a marked expansion in volume of such fibers will take place.

The proteinoid fibers such as those derived from milk, soybeans, and peanuts were originally developed as a substitute for wool. They are now being used as diluents for wool in blends, but the technology of these fibers has not been sufficiently advanced so that they may be considered as wool replacements.

New Glass Fiber

The relatively recent development of a fiber from glass has afforded an excellent material for electrical insulation and for fire-
proof fabrics, and further progress is being made.

There is a principle in the foregoing examples that will vitally affect the future of the cotton business: The growth of the synthetic fiber industry is the result of a real need—fibers having definite desirable properties have been produced for a given purpose. Further, the synthetic manufacturing process may be altered to produce a fiber which emphasizes a single given property, thus making the fiber “tailor-made” for a specific purpose. For example, the diameter of the synthetic fiber may be made fine or coarse as the needs demand. It can be made in continuous lengths or stapled to any desired length, it can be made with or without luster, it can be made to have a round cross section or a serrated cross section; it can be made of normal strength or by stretch spinning to have a higher tensile; it can be made with crimp or without crimp. Truly then it can be said to be a “made to order” fiber. The continually improved position of the synthetic fiber industry is the direct result of progress made in the preparation of a uniform fiber and in fabrication from the fiber, and this progress has been accomplished through unceasing research.

Let us be specific: the first rayon manufactured had poor physical properties and had to undergo much technological development before it attained its present favorable characteristics. The first field that rayon entered extensively was dress goods, where its smoothness and soft hand were very desirable properties, and where it was a popular novelty. From this as a beginning, the rayon technologist developed a fiber that was not only silk-like in appearance, but had increased strength and therefore could be used in other fields. Having done well in these first fields of style and apparel, the rayon manufacturers have cast more than covetous glances at the extensive mechanical and industrial markets for textiles, of which the tire cord trade is an outstanding and currently notable example. Whether by design or accident, they appear to have surveyed the most extensive and lucrative markets possessed by cotton manufacturers and by diligent research to have developed a fiber that would be most suitable for those markets.

Analyzés Cotton Fiber

Let there be no misunderstanding: these statements imply no resentment against the synthetic fibers—they have earned their present place by right of conquest and have been a real contribution to society. The synthetic fiber industry is here and here to stay because it fulfills a definite need and does it well.

Now that we have noted the development and growth of synthetic fibers, let us consider the cotton fiber. Cotton possesses certain inherent advantages over other fibers, synthetic or natural, which account for its present predominance in the textile field. It occurs naturally in a fiber form, whereas the synthetic material must be fabricated into fibers. It occurs as a rather pure form of cellulose, while the cellulose in wood, which is the largest source used in rayon manufacture, occurs along with lignin, a very troublesome substance. Cotton’s relative purity affords great stability—it is relatively insensitive to ordinary degradative influences. It is independent of temperature effects, being flexible at low temperatures and remaining so at high temperatures without becoming plastic or fluid. The great tensile strength of the fiber is well-known; the wet strength of the yarns and fabrics made from cotton may be envied by most other fibers. The cotton fiber itself possesses the flat, ribbon-like structure of a collapsed cylinder, with convolutions along the surface, which naturally enhance its spinning qualities. Cotton has highly favorable flexing properties and fabrics made with this fiber offer good resistance to abrasion.

Why do I mention all these desirable properties of the cotton fiber? Simply to show that the cotton textile industry has had a superior raw product with which to work all along, that the present position of the industry is due almost entirely to this fact alone, and, most important of all, that these outstanding attributes make a splendid starting point for research work.

Industry Too Lethargic

Let me add immediately that the cotton industry as a whole has assumed a lethargic attitude and has paid little attention to improvement in the cotton fiber itself so that it might meet the demands of the trade and the competition of the synthetic fibers.

Cotton has been in a favorable economic position with respect to synthetic fibers. This in part is due to the fact that the cost of producing the two types of fibers has not heretofore approached comparison. Fortunately, the seed of the cotton fiber is a by-product, which is a rich source of oil and nitrogenous material. The linters from around the seed compose the raw material for cellulose acetate and for nitro-cellulose which is used in lacquers and guncotton. These well-developed by-products account in part for the low cost of the raw material, and should help the fiber remain in a competitive position with the newer fibers.

Of course, the cotton textile industry had rather continue using cotton—tradition, sentiment, and experience all make us favor cotton. But we must face the fact that if the synthetic industry furnishes us with a fiber which more adequately fulfills a given need, we can rather easily convert our productive equipment to handle this raw material. For example, most cotton mills can process staple rayon with few, if any, changes. It is therefore incumbent upon the entire cotton industry, from the breeders on through the sales organizations, to face this situation. If serious economic losses and social dislocations are to be avoided, a sustained program of cooperation and research will have to be accomplished.

The program of action must be
Callaway Research Building

comprehensive, extending from the cotton field right up to the ultimate consumer of the goods.

In the first place, research on breeding should be continued and the results of this research should be applied extensively through cooperative agencies.

Improve Raw Material

Second, the raw material as it comes to the mill can very definitely be improved by better handling from the field through the cotton gin. This can be accomplished only by the concerted efforts of research-minded men, through the use of scientific methods, and by the correlated efforts of the various groups now established to safeguard the cotton industry as well as the cotton textile industry.

In the third place, each manufacturing process should be the object of continued study and possible improvement. The textile machinery manufacturers should cooperate with the mills in developing machinery which will give a more uniform product faster and with greater efficiency.

Fourth, economic research should be conducted and an even more vigorous publicity campaign be launched. From the economic research should come information about possible new markets, and the advertising should be used so as to reach these markets effectively.

Fifth, and most neglected, is the study of the physics and chemistry of the fiber. This work must be greatly extended since it is only through such an approach that the cotton fiber may be tailored to a specific need. Much fundamental work must yet be done on the constitution and properties of this raw material. For example, if we could improve the extensibility or elasticity of cotton, this audience is well-aware of what far-reaching results would come from such a discovery. Without a doubt improvements can be made in such features as crease resistance, flex life, resistance to abrasion, draping quality of the fabrics, hand or feel, and appearance of certain fabrics. Cotton can be made to replace linen and certain of the best fibers and enter fields where it has never been heretofore.

Agencies at Work

There are a number of agencies at work at present in such studies. They are doing splendid work on relatively small appropriations and are nominally cooperating at this time. It is to be hoped that this cooperation may be accelerated. It is certain and recognized that much duplication of effort now exists. This is most unfortunate since there is vastly more work to be done than our under-staffed laboratories can possibly do to assure the future of cotton.

What has been discussed here is not new to you gentlemen. As a matter of fact, much of the program outlined is already organized but not working as effectively as possible. Too many of us have been content to say, "Yes, something is
going to have to be done,"—and then, like Margaret Mitchell's immortal Scarlet O'Hara, we add: "Oh, I'll think about it tomorrow."
And while we have been putting it off, many opportunities have been lost, and the competition has been active. Only last week the War Production Board designated rayon for tire cord for the Army and Navy contracts. It is happening to us right now. Competition, like death and taxes, is always with us, and the sooner we are able to swap blow for blow, the better off the whole cotton industry will be.
There is an appreciable time lag between beginning a research program and producing useful results. Most any worth-while research program we set up will call for painstaking, scientific investigation, and this of necessity takes time. It is obvious that the answers to our questions or the desired results will not be easily found, for products or processes easily found have long since become commonplace. Pursuing a research problem is not like putting up a building. You can't follow a set of blueprints. Although your objective is kept before you all the time, you must travel up many avenues and approaches, only to find a number of them have dead ends. Many interesting things of possible value are encountered all along the way however. Yes, research of necessity takes time, but when a well-defined program is diligently followed there can be no doubt as to the future of the industry pursuing such a program. If cotton is to have a future, the time to begin is yesterday.

"Cottonleather"--A Fabric Substitute For Leather

BY T. A. TURNER, JR., '44

It is a known fact that during and immediately following a period of warfare the ingenuity of people the world over is unleashed and is thrown on the world for the approval of the people. One of the more recent examples of American ingenuity has just been announced, and promises to bring about a decided change to our everyday living.

This new discovery is particularly interesting to men in the textile and shoe manufacturing business. It is also of great importance to the farmers of this Nation who are devoting their lives to the growing of cotton. With its entire present output already sold to national shoe manufacturers and negotiations under way for the licensing of other factories to manufacture its patented "Cottonleather," a fabric substitute for leather, the Southern Friction Materials Company of Charlotte, North Carolina, is being deluged with inquiries by shoe manufacturers hopeful of finding a successful substitute for leather now that leather shoes are rationed.

Mr. John O. Camp, sales manager of the company, very recently announced that manufacturers in every section of the country were telegraphing and telephoning for complete information about "Cottonleather." The company has orders many times the present capacity of the plant to produce. Mr. Camp estimated that there is a potential present market for fifty million pairs of "Cottonleather" shoes.

Leading authorities of shoe manufacturers who have been experimenting with "Cottonleather" have expressed their opinion that it is the best substitute for leather shoe soles yet developed. One major shoe company in the South which has made comprehensive tests of the material claims that "Cottonleather" outwears present shoe sole leather. One of the largest manufacturers of shoe machinery who recently completed tests of the fabric say that it is adaptable to the various shoe manufacturing processes with the use of existing shoe machinery. This is a big factor now that it may be virtually impossible to procure priorities for materials with which to convert present shoe manufacturing machinery.

Shoes may be manufactured from "Cottonleather" as soles and other fabrics, particularly cotton, without the use of leather and such shoes are not rationed. The material, the basis of which is cotton chemically treated, is manufactured in two, three, four, and five ply thicknesses. It may be used for both men's and women's shoes of various types and styles, particularly sports shoes and work shoes. The company is now working on a fabric for shoe uppers.

This fabric was developed primarily for the manufacture of brake linings, but at once many other uses were seen for the fabric. Since the recent order for the rationing of shoes throughout the Nation interest in the fabric increased to such an extent that the company was bombarded with inquiries, some from foreign sources.

It was seen at once that the use of the fabric on a widespread scale (Continued On Page 17)
Today there is in general use two types of industrial lighting, namely, incandescent lighting and fluorescent lighting. All bulbs which screwed into sockets, and which have been used extensively in most mills up until recently, are the incandescent type lamps. Today, however, the trend in industrial lighting is toward the fluorescent type lamp. Most of us are familiar with the fluorescent lamp. The lamp itself is a tube which ranges in size from nine inches in length and five-eighths inches in diameter, for the six-watt lamp to sixty inches in length and two and one-quarter inches in diameter for the hundred-watt lamp. In most practical applications it gives off a day-light blue, although it can be obtained in a number of other colors and in white. We are attempting to describe the fluorescent type of lighting here for the benefit of those who do not know much about it— as it is a comparatively new thing.

There are many advantages to fluorescent lighting, the greatest being high light out-put per watt of power used as compared to a low light out-put per watt of power in the incandescent lamp. The incandescent lamp gives off light from a filament which is caused to glow by an electric current passing through it. Only 10 per cent of the electrical power or electrical energy used is converted into light; the other 90 per cent goes into heat and is given off. The fluorescent lamp operates under an entirely different principle. The lamp is lined with a white phosphor fluorescent powder (a different powder for each color—for daylight lamps the powder is Magnesium Tungstate). In the lamp, or tube, there are two small filaments or electrodes, one at each end. The filaments do not give off any light to speak of. An arc jumps back and forth from one filament to the other many times a second. The radiation from this arc, or flow of electrons, strikes the phosphor fluorescent powder and causes a radiation of a different wave length. This radiation is the light which is given off by the fluorescent lamp. Thus, the light given off is not from any electrical source directly, but comes from the phosphor fluorescent powder which is caused to give off light by the action of the electric arc.

The fluorescent lamp is much cooler than the incandescent lamp because of the small amount of power or energy the two small filaments of the fluorescent lamp use.

The advantages of fluorescent lighting in textile mills are many. A room lighted by fluorescent lamps has a very uniform light that is well diffused. The 40 watt fluorescent lamp will light 225 square inches as compared to 20 square inches which the incandescent lamp will light.

In the weave room a uniform light of high intensity which is practically the same as daylight can be obtained at a much lower cost than that of the incandescent lamp. In a mill weaving fine or colored goods fluorescent lighting is especially important. In every cloth room fluorescent lighting is very important in conjunction with cloth inspection. Not only in the weave room and cloth room is it important, but all over the mill. Fluorescent lighting is better for the worker’s eyes, which in turn improves his working conditions. Improved working conditions in the mill will aid in increasing production and raising the quality of the goods. In very modern mills where there are not any windows, and in air-conditioned plants lighting can be kept uniform twenty-four hours a day. In the finishing and dyeing plant fluorescent lighting is important where shades are being matched. Knitting mills need this new type of lighting because the parts in a knitting machine are small, and also because the knitted fabrics must undergo the same inspections as in the weaving mill.

The 100-watt unit is suitable for use in mills. It weighs about 25 lbs. The unit contains two 40-watt tubes which are 48 in. by 11/2 in., and an auxiliary (necessary to supply correct tube voltage). The tubes are mounted in a simple white porcelain reflector which measures about 55 in. by 10 in. with the auxiliary mounted on top of the reflector. The unit should be suspended from the ceiling by two chains. A spring attached to each chain is recommended in order to cut down the vibration which is especially bad in the weave room.

In the weave room one 100-watt unit to every 64 sq. ft. of floor area should be suspended perpendicular to the harness, 9 ft. above the floor. For Slubbing, Roving, Spinning, Waging, Beaming, Slashing and Knitting, the unit should be suspended 11 ft. above the floor, one to every 100 sq. ft. of floor area. For Opening, Mixing, Picking, Carding and Drawing, the unit should be suspended 13 ft. above the floor, one to every 144 sq. ft. of floor area. For the cloth room, Inspection room, and Drawing-in by hand, the unit should be about 7 ft. above the work, one unit to every 36 sq. ft. of floor space. These recommendations are only approximate, and may be adopted when using the daylight-type lamps in the unit. In addition, it is recommended that the walls be painted as light a shade as practical.

Fluorescent units have power factors just as electric motors do. The power factor of a fluorescent unit should be .95 or above. If the power factor is not corrected to .95 or above, the power company will be reluctant to allowing the mill to use the fluorescent unit, or will charge the manufacturer more per kilowatt hour as read from the meter. The volt-amperes necessary

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The Editor Says—

DEAN WILLIS RESIGNS

It was with deep regret that we, the textile students of Clemson College, heard the announcement on February 2 that our Dean and friend, Mr. H. H. Willis, had handed his resignation, to become effective February 6, to Dr. Poole, President of the College.

During the time that we have been at Clemson we have seen the Textile School grow in size and we have seen its reputation as a Textile School improve greatly under the competent leadership of Mr. Willis. Before the beginning of the present war we saw all the graduates of the school secure positions of importance in the industry and we saw a much greater demand for graduates than the school could supply.

Many times we have talked over our problems with Mr. Willis in his office and he has never failed to give us his attention and support. He was greatly interested in improving the school in any way he could, especially through the work of the students after they left the school. On more than one occasion he has shown his extreme interest in our publication, THE BOBBIN AND BEAKER, and has done all in his power to help put the publication over to the public. He has constantly been on the alert to maintain and improve the reputation of Iota Chapter of Phi Psi, located at the Clemson Textile School.

Mr. Willis, while serving the Textile School as Dean, has made an untold number of friends for himself and for the school; he has built a school of which we are justly proud.

While he carries on his new work in the industry, Mr. Willis plans to make his home on the Clemson Campus. It is our sincere hope that he will not become lost to the school but will maintain close relation with us, the students, and with our predecessors in the industry.

M. D. M.

R. K. EATON NAMED ACTING DEAN

Mr. R. K. Eaton has been named acting Dean of the Clemson Textile School to fill the vacancy created by the resignation of Mr. Willis. Mr. Eaton has been with the school as instructor for a period of years and has grown to be admired by everyone who, in any way, is related to the school. "Pop", as he is called by those who know him intimately, has been an outstanding leader in the school since he first joined the staff and he is recognized by leaders in the industry as an authority on mill economics, textile management, and textile processing.

We are glad to see one so interested in the school become our Dean. We know that he will be faced with many serious problems now and in the future as the war continues. His first problem, one of vital importance, is a shortage of teachers in the school. This has been caused by so many of our teachers being called into the armed forces of the nation at a time when they cannot easily be replaced. However, we feel that the staff now at the school will cooperate to the fullest extent possible to overcome this problem so that Mr. Eaton may lend his efforts to other situations as they arise and maintain the reputation that the school has obtained.

We feel sure that Dr. Poole, in making the appointment to the position of acting Dean of the school, could have made no better choice and it is our hope that one so interested in the school as Mr. Eaton will be given the position when it is filled, not temporarily, but permanently.

M. D. M.

OUR GRADS NOW SERVE

Approximately five hundred graduates and former students of the Clemson Textile School are now serving in the Armed Forces of our Nation. They came to Clemson from many walks of life but they all left with one point in mind, never to commit an act or deed that would discredit their Alma Mater in any way. They returned to many walks of life but that one point has still remained foremost in their minds and today they are proving their worth on the fields of combat throughout this war-torn world. If they die, they will know that they have not died in vain; if they live, they will return to see the results of their sacrifices.

We at home, away from the bleak and desolate battlefields on which our boys are fighting, cannot express in words our thanks for the way in which they are serving to make the world safe for Liberty and Democracy.

With reference to those sons of Clemson who have made the supreme sacrifice, we can only say with the poet,

"There is no holier spot of ground
Than that on which defeated valor lies."

M. D. M.

WE ARE GRATEFUL

This is the last issue of THE BOBBIN AND BEAKER to be published by the present staff and it is our sincere hope that we have at least partially accomplished our purpose in publishing the magazine. It is now that we wish to take time out to express our appreciation to those who have made the publication of the magazine possible.

First, we appreciate the cooperation of Mr. H. H.
Willis, Mr. R. K. Eaton, and Mr. J. C. Littlejohn and his staff for their valuable advice and aid. We appreciate the guest editorial by Mr. W. M. McLaughlin, Secretary and Treasurer of the American Cotton Manufacturer’s Association. We are grateful to Mr. John T. Wittington, Director of The Cotton Textile Institute, for his articles and his wonderful display of interest in our publication. We also wish to thank Mr. Perrin N. Collier and Mr. F. S. Blanchard for allowing us to reprint their articles in this issue.

Thanks, too, to the Clemson Textile Students who have done the actual work on the magazine.

And last but not least, we wish to thank our advertisers for making the publication of the magazine possible. We hope that our services have proved and will continue to prove as valuable to you as yours have to us.

M. D. M.

UNTIL VICTORY IS OURS

It is with much regret that we must announce the possible suspension of publication of THE BOBBIN AND BEAKER for the duration of the present war. Under such conditions as exist now the publishing of the magazine has become increasingly more difficult and the continuance of such conditions will soon make publishing an impossibility. However, after victory is ours and existing conditions improve, THE BOBBIN AND BEAKER will return to its friends in the school and in the industry.

For four years since the organization of THE BOBBIN AND BEAKER by Iota Chapter of Phi Psi the magazine has been published by the students of textiles at Clemson College. During this time the magazine has gained the recognition and confidence of the industry; advertisers have realized that it is a sure way of getting their messages to the industry. The free mailing list of the publication has grown to include every textile mill in North Carolina, South Carolina, Georgia, and Alabama. The magazine has received much favorable publicity in such trade journals as The Textile Colorist and The American Wool And Cotton Reporter and in trade papers as The Daily News Record.

A staff has been named to publish the magazine next year if publishing is possible. It is our sincere hope that we may continue to keep, without interruption, our contact and increasing friendly relations with former students of textiles at Clemson and with the entire textile industry.

M. D. M.

Phi Psi Inducts Seven New Members

Above are the seven men recently inducted into Iota Chapter of Phi Psi, national honorary textile fraternity. They are, from left to right, front row, C. J. Taylor, F. C. Rogers, and Leon Tigler. The men in the back row are Professor W. B. Williams, T. A. Turner, E. T. McIlwain, and J. B. Rhame.

Photo by R. G. Hufford
Willis Resigns As Dean--Eaton Takes Over

BY M. D. MOORE, '43

H. H. WILLIS

On February 2, Mr. H. H. Willis made public the announcement that he was resigning his position as Dean of the Clemson Textile School. Since Mr. Willis first began to serve the school in this capacity the school has grown from an enrollment of 70 students and 4 teachers to 350 students and 15 teachers prior to the present war. In resigning this position, Mr. Willis brought to an end his direct leadership of the school which he has very capably handled since 1927 when he was appointed to the position.

Mr. Willis was reared in the mill town of Clifton, South Carolina. He had approximately nine years of practical experience in general textile work with the Clifton Manufacturing Company at intervals prior to 1917. Shortly after graduation from Clemson in 1917 he enlisted in the army for the duration of the war. He served as a private and sergeant at Fort S Creven, Georgia, and in September, 1918, was commissioned a Second Lieutenant and sent to Edgewood Arsenal, Maryland, as property officer. He was later transferred to Camp Upton, New York, as paying officer during demobilization. He was honorably discharged in September, 1919, having served some twenty-six months.

After this service, Mr. Willis held a position with a bank in Spartanburg for a short time, resigning to accept an instructorship in the Clemson Textile School. He resigned this work in September, 1920, to accept a position as Assistant State Supervisor of Industrial Education in North Carolina. In 1921 he resigned this position to accept a position as Cotton Specialist with the U. S. Department of Agriculture, Bureau of Plant Industry.

He was connected with the U. S. Department of Agriculture from 1921 to 1930. During the first three years of his work with the Department of Agriculture, he spent considerable time in the Southwest (Texas, Arizona, and New Mexico) in selecting certain varieties of cotton for spinning tests. Many of these varieties were tested at Clemson and in mills in the East. He made two surveys in Eastern mills with reference to the utilization of certain of these varieties of cotton.

In 1927 Mr. Willis was made Dean of the Textile School at Clemson in addition to his duties as Cotton Specialist, in charge of the cooperative cotton spinning research work. He continued to act in these two capacities until July, 1930, at which time he resigned his government connection in order to devote full time to the Clemson Textile School.

Dean Willis is the author of some fourteen government bulletins. While on this spinning work he prepared some forty reports of spinning tests mainly for the information of the Cotton Division of the U. S. Department of Agriculture. He is also the author of some eighteen articles which have appeared in various textile magazines. He is the co-author of some seven books dealing with cotton yarn manufacturing. These books were prepared in cooperation with the Textile Foundation, Washington, D. C. On this work he was assisted by R. K. Eaton, Gaston Gage, W. G. Blair, and G. H. Dunlap, members of the faculty of the school, and Miss Vernette B. Moore, specialist in Educational Methods. These textbooks are now being used in textile schools as well as in textile plants which are conducting classes in textiles.

From 1927 to 1938 approximately, with the cooperation of the staff, Mr. Willis secured for the school, through donations, over $40,000 worth of equipment and supplies.

For several years Dean Willis and Dr. Sikes, deceased, did much work in South Carolina in acquainting the people and the Legislature with the need for an adequate textile building. As a result a $475,000 building was erected in 1938. During 1939 Dr. Sikes and Dean Willis discussed with cotton manufacturers of South Carolina a plan for raising additional money to buy equipment for the new textile building. A committee, consisting of J. E. Surrin, J. B. Harris and R. H. Chapman was formed. This committee during 1940 and 1941 raised approximately $45,000 from manufacturers interested in the Clemson Textile School. The outbreak of war and priorities have postponed temporarily the purchase of this new equipment.

On May 26, 1942, Dean Willis presented a plan for the establishment of a textile training foundation. Six objectives were outlined, including the promotion of textile training in schools and colleges, the promotion of further training for skilled workers within the mill, the establishment of better relations between workers and management, and the provision of a competent consultative service prepared to give specific aid on technical and human relations problems.

Dean Willis served the Federal Government as chairman of the Cotton-Textile Industrial Relations Board for South Carolina under the NRA dealing with technical and human relation problems in the textile industry. During the past two years he has served as arbiter and advisor on many such problems, in some cases called by the Federal Government, in other cases by the mill management, by the union, or by management and union jointly.

He now plans to devote part of his time to a textile training program in South Carolina which offers guidance and assistance to young men in the textile industry.
in getting additional training in textiles. He will devote some time to co-operative work in labor relations and technical work. Mr. Willis will continue to make his home on the Clemson Campus while he carries on his new work.

R. K. Eaton

Immediately after the announcement by Mr. H. H. Willis that he was resigning his position as Dean of the Clemson Textile School came the announcement by Dr. R. F. Poole, President of Clemson College, that Mr. R. K. Eaton had been named Acting Dean of the School until such a time as an appointment to the position could be made. Mr. Eaton, in taking over the school, realizes that he will be faced with many problems brought about by the present war but he is prepared to give his undivided attention to the solution of these problems.

Mr. Eaton was born and reared in the town of Taftville, Connecticut, in 1883. When asked why he decided to enter the textile industry he simply states that he was born and brought up in the industry, having started going to a mill to see his father at the early age of five. Mr. Eaton attended and was graduated from Bowdoin College and later did graduate work at the Philadelphia Textile School in Textile Chemistry and Textile Designing.

His first connection with the industry was with the Whitin Machine Works, serving them for a period of four years from 1907 to 1911. For the first three years of this period Mr. Eaton was employed in erecting cards and spinning frames, and during his last year with this firm he was associated with the Whitin Experimental Waste Plant, Ashburnham, Massachusetts.

Desiring to enter another field, Mr. Eaton accepted a position as Assistant to Agent in charge of cloth contracts with the Cabot Manufacturing Company of Brunswick, Maine. This position he held until 1916 when he was promoted to the position of Superintendent of the Cabot Manufacturing Company. Mr. Eaton served as Superintendent of the Company until 1922 except for a period of nine months 1918-1919 when he served as a First Lieutenant in the Chemical Warfare Service in charge of Inspection and finishing gas mask materials. During these nine months he was stationed at Saylesville, Rhode Island.

In October, 1923, Mr. Eaton came to Clemson College as professor of Weaving and Designing. However, in 1925, he was transferred to the department of Carding and Spinning and it was in the capacity of professor of Carding and Spinning that he was serving the school when he was appointed Acting Dean of the School.

In 1926 there was some talk on the Clemson Campus and in the textile school of promoting the establishment of a Chapter of Phi Psi, National Honorary Textile Fraternity, in the Clemson Textile School. Being appointed by the late Dr. E. W. Sikes, it was the duty of Mr. Eaton along with Dr. Calhoun to study National Fraternities and make a report to Dr. Sikes. At this time, and upon the recommendation of these two men, the policy of allowing honorary professional fraternities to exist on the campus changed and the students of the textile school were allowed to apply for an active Chapter of Phi Psi, provided its membership would be made up of above average students. Had it not been for the recommendations of these two men Iota Chapter of Phi Psi would not have been organized in the Clemson Textile School at the time and it probably would not have attained the high reputation that it holds today. Iota Chapter was formed and presented with a charter on May 5, 1943. During induction period of the Fraternity in 1928, Mr. R. K. Eaton was made a member of the Chapter at Clemson.

Mr. Eaton is the author of numerous articles which have appeared in the trade journals of the textile industry over a period of time.

He is co-author of the textbook used in the school's course in Roving Frames. On the campus he is admired and respected by all who know him, being a charter member of both the Forum Club and the Fellowship Club.

PLANNING FOR PEACE

(Continued From Page 3)

blesses now but we can prepare for some of the emergencies.

In our war program, we have a definite objective of victory. We are planning and preparing for many of the possibilities of war, both offensively and defensively, that may occur. Some of them will happen, some will not.

In looking over the post-war situation, there can be the definite objective of peace and we can set up certain definite objectives, both offensively and defensively, that will be our goal.

Our schools and colleges must be alert to the changes in our industrial life. They must lead and not follow the plan. They must discover and interpret rather than become rigid and decadent.

Our business men and political leaders must look into the kaleidoscope of myriad colored problems and try to discover what can and must be done.

Our ministers must try to find a way of presenting the divine plan of life so that it will appeal to the masses and give them an underlying philosophy upon which to build their lives.

Our great public must arouse itself from indolent thinking and selfishness and look to the post-war morn and make plans for the new day.

Humpty Dumpty must look far and wide so that he will not be knocked off the wall again. The new world will be a much better world or a much worse world. There will be no return to normalcy as we have once known it. The world is a little place and all people are physically neighbors.

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Research As An Essential In The Textile Industry

BY JOHN T. WIGINGTON

Director, Division of Textile Research, The Cotton Textile Institute, Inc. National Cotton Council of America

A recent editorial of Dr. William P. Jacobs, Executive Vice-President and Treasurer of the South Carolina Cotton Manufacturers Association began with the following sentence: “A great writer has said that nothing is permanent except change.” Every cotton manufacturer should have this sentence reproduced and displayed prominently in his office where it will serve to keep him receptive to new ideas and give him vision with respect to his job and its possibilities.

Cotton textiles have for the past two years enjoyed one of the most prosperous periods in the history of the industry. With a third fewer active cotton spinning spindles than were in operation during World War One, the textile industry is now consuming at the rate of approximately 1,000,000 bales of cotton per month, as compared with some 500,000 bales per month during World War One. Enormous quantities of fine combed cotton yarns and cotton fabrics have gone and are going into equipment for our armed forces, as well as to the civilian trade.

This tremendous increase in production merits particular attention and demonstrates that research, technical skill, and a willingness to make changes have been responsible for new yarns, new fabrics, and new finishes. The industry is to be complimented upon its achievements; however, now is the time to hoist the RED FLAG of warning; now is the time to plan for post-war textiles. With the close of the war, the present war-market will collapse. In the post-war civilian market, cotton manufacturers will be confronted with keen competition from synthetic fibers such as aralac, nylon, and rayon, as well as from natural fibers such as silk, flax, hemp and jute.

How will the industry meet this competition? To do so, it is imperative that the cotton manufacturers devote more of their time, more of their effort, and more of their money to research. Competition can be met successfully only by a well-planned and well-executed program of research, in which the chemist, the physicist and the engineer will bring their training to bear on the development of the latent possibilities of the cotton fiber. The chemist and chemical industries have already been of tremendous help to the cotton textile industry by contributing new dyes, new bleaching agents, mildew-proofing preparations and permanent water-repellent processes. These developments have meant much to the industry but they are but a beginning. The post-war chemist may so treat short staple cottons as to give them the properties of strength found in jute and sisal; the absorption properties found in flax; the luster of silk; and the rough finish characteristic of wool.

For a quarter of a century Mr. Douglas Woolf, Editor of TEXTILE WORLD, has been trying to awake the textile industry to the value of research. The following is quoted from his editorial in the December, 1942, issue.

“Mr. Textile Manufacturer, do you know just what you have to do to make research work for you and to insure your survival over the war period, with inevitable dislocation of our economy, and to save a place for you in the post-war readjustment?”

“Here are the answers:

1. You must shed your conception of research as a force that is all right for the automobile manufacturer, the electrical-equipment manufacturer, the paper manufacturer—and take to your heart the realization that research is the answer for you, your company, and your industry.

2. You must grasp the fact that, in a decentralized industry such as textiles, only a relatively few firms can engage in individual efforts compatible with the need. The great majority of companies must herd together in an all-out cooperative job. And in this, they will find those relatively few big concerns on their side. The record shows that those companies have been in the vanguard of the coordinated research movement. The reason is that, in the fight of the textile industry for survival, there is and should be no intra-competition.

3. You must accept the fact that research is not a gift of the gods. It is something that you yourself must create and support and pay for—both in money and in the time of your key-men.

4. You must know that control laboratories do not represent research; they are merely a part of your operating job. To share in the results of cooperative research, you must develop an organization, relative to your size and your financial ability—whether it be one man with a microscope, or a group of men in a well-equipped laboratory. This must be your connection with the industry’s program: your chance to utilize in your own mill the results of that program.”

The recent announcement of the organization of the North Carolina...
The machinery has been adapted to manufacture widths up to thirty-two inches, which will permit greater economy in cutting soles. While the present price for soles made of “Cottonleather” is higher than that of soles of better grades of leather, President Howard Snow is confident that with mass production methods in operation the prices may be made equal to those of the best leather.

“Cottonleather” is exciting the interest of manufacturers of products other than shoes. A transportation company is experimenting with it as a possible substitute for metal and linoleum step and floor pads. One of the Nation’s largest automobile manufacturers is testing it for a fender support application. Other suggested uses include motor mounts, shockproofing, reinforcements for heavy bags and pounches and many other uses where leather has heretofore been required.

There are many uses of cotton as substitutes for strategic materials in this war which are now in use. Don’t be surprised when other uses for cotton are announced in the coming months. Yes, cotton definitely has a great future in fabrics. Hail, King Cotton!

"PLANNING FOR PEACE"
(Continued from Page 15)
Socially and economically they must be neighbors and that means they must be mentally neighbors.

We must not wait for peace to make our plans. We must begin with the blue prints now, even though they must be changed as the period approaches. The problems of peace will be as difficult and as expensive as the problems of war. In war, we plan for a few years only; in peace, we plan for a life time. We must look in all directions.

This is the American way. This is the problem of the American system of free enterprise.

**PHI PSI FRATERNITY TO MAKE AWARD**
BY L. H. HANCE, ’44

In coordination with Mr. A. E. Snyder, chairman of the committee of the presentation of Phi Psi awards by the National Chapter, the textile department of Clemson has been busy selecting the student who will fill all of the necessary qualifications. The award is to be made on Honors Day in May and will not take the place of the textile chemistry award by the Textile Colorist or the textile engineering award for scholarship. The Phi Psi award will be given to a senior student taking some course in the textile field. Membership in Phi Psi does not constitute a prerequisite.

Acting dean, Mr. R. K. Eaton, has already appointed four members of the faculty to assist in making the final choice. The award itself is to be a beautiful pocket-book and letter-case set, made of Ostrich leather and lined with calf-skin. Inside each article will be embossed the coat-of-arms of Phi Psi Fraternity and the recipient’s name printed in gold. In addition he will be presented with a suitably engraved certificate, certifying that this honor has been given to him.

The basis for selection which the faculty committee will use as a guide is as follows:

| Scholastic standing (analytical powers, accuracy, reliability) | 60 points |
| Leadership | 10 points |
| Personality (poise, maturity, sociability, personal appearance) | 10 points |
| Initiative | 10 points |
| Loyalty and Courtesy | 10 points |

100 points

Since the alphabetical rating systems vary, a man to be eligible should have an average of 80 or better, or what would ordinarily constitute a B rating in most systems.
The tremendous sales of finished textiles to the Army and Navy have made textile producers very cautious in buying the best grade cotton. Military specifications have always been tough to live up to; margins on war contracts are satisfactory. Because of this, cotton mill men lean heavily toward the safe side and buy the best raw cotton they can find. Of course this means cotton of long staple and good variety.

The Department of Agriculture is growing more alarmed daily because of this situation. The trend toward mills using higher grades of cotton is thus depleting reserve stocks of the higher grades more rapidly than stocks of other cotton. Consequently, the future holds in store for the mill men a prospect of heavy stores of low grade cotton and nothing else. It follows that if there is not more raising of best grade cotton this year, the military specifications must necessarily decrease.

People may ask about the surplus of lower grades of cotton. This surplus does not present any difficulties. The war has awakened the ingenious American mind and every day countless patents are being received in Washington on synthetics and plastics made from short staple, low quality cotton. Eventually these patented articles will find a great many uses in our everyday life and will consume most of the lower grades of cotton.

The question arises, then, as to where we will obtain the high grades of cotton necessary to keep our Army the best dressed Army in the world. With longer staple in demand, the government encouraged increased seedings of this type for last year's crop and witnessed a wonderful response. In the main cotton belt, shifts from short and medium staple to long staple were sharp enough to consume the entire available supply of long varieties.

In the irrigated belt of Arizona and New Mexico acreage of the American-Egyptian long staple was up 51% over 1941 and 202% over 1940. Altogether last year was the biggest year in proportion of long staple cotton to the total crop. However, this year promises to even top that record of last year. This year the consumption prospects at the moment exceed twelve million bales. This means that a second year of digging into cotton surplus is not to be avoided since the 1942 crop was estimated at slightly less than twelve million bales.

This is progress even though about one year's production of cotton is still stacked up in this country. Stock in public storage and compresses in June, 1942, had dropped 20% below a year before but still stood at the figure of 8,459,000 bales. At the same time cotton stocks in mill hands were at a record high for June 30, totaling 2,441,000 bales.

At worst, however, cotton's future is looking much better than anyone had believed before Pearl Harbor. Domestic consumption has boomed so sharply that it was about 40% higher than any year before the 1940-1941 season, totaling approximately 11,000,000 bales. However, the new World War has produced blockades and shipping shortages. It produced a lack of exchange with which to buy foreign goods, thus concentrating foreign purchases only on those items needed for the prosecution of the war. As a consequence, cotton exports have fallen to an extreme low. Exports of American cotton during the 1940-1941 season amounted to only 1,100,000 bales—an 82% decline over the 1939-1940 crop season.

Then, with all these facts before us, we like to think of the future of cotton. Rayon came into being only a few years ago; plastics have just been born. Trucks are taking the place once occupied by railroads and water is giving up to the Diesel motor in the production of power. New methods, new machines, new products, continually displace the old because of the profit motive or the progress motive.

Whatever our desires may be, however great our needs, cotton manufacturers will continue to meet the changing conditions and necessities of the times. The cotton textile industry has survived many reverses and will undoubtedly meet with many more which will throw it off balance in some way. However, regardless of the shape of things to come, the cotton textile industry is daily growing and will continue to grow. The future of today's textile master is bright.

(Editor's Note: Statistics in this article taken from "Business Week," August 15, 1942, issue).

"RENAISSANCE"

(Continued from Page 5) These last are called the Cotton Fiber Research, Cotton Procession, and Cotton Chemical Finishing Divisions.

"The Cotton Fiber Research Division conducts investigations on the chemical and physical properties and structure of cotton fiber as these relate to its utilization, and works on methods for modifying these properties of the fiber to suit requirements of specific uses. Current work includes research on stabilization of nitrocellulose from cotton and cotton linters and the impregnation of cotton fiber to make cotton fire-proof and mildew-
proof and to give it other properties desirable for specific uses.

"The Cotton Processing Division conducts research on the development of new and improved cotton products for specific uses and seeks to develop new methods and machinery to improve the quality and lower the cost of cotton products. To provide equipment for this Division, a textile mill 95 feet long by 62 feet wide was constructed in the industrial pilot-plant wing. This mill occupies three floors and is completely air-conditioned, with an individual air-conditioning unit for each floor, so that the temperature and humidity on one floor can be varied without affecting any other section of the mill. The degree of control of both temperature and humidity is greater than that in the best air-conditioned office. To insure such a high degree of atmosphere control is expensive, and although the mill occupies only a part of the industrial wing of the laboratory, its cost is over $95,000. In air conditioning this mill, our purpose was to make possible the exact reproducibility of results and their application in the cotton textile industry. Besides being able to reproduce the results of experimental runs, we want to be able to make runs under various controlled conditions representing the climate prevailing in particular localities throughout the country. This $1,000,000 experimental mill includes modern standard textile machinery for all steps in the manufacture of cotton fabrics, from opening through weaving, and the necessary auxiliary equipment such as that for winding and warping. There is also connected with the mill a modern testing laboratory, equipped with machines for making a wide variety of physical tests on textiles.

"One of the projects on which the technologists in this Division are now working is the development of suitable cotton bags for handling raw sugar. They have just finished spinning yarns and weaving them into fabric for making 400 experimental bags to handle Hawaiian raw sugar."

"Another current project is the development of a suitable cotton binder twine to supplement supplies of binder twine made from imported sisal and henequen."

Thus, we see that men are busy in this great laboratory carrying on various research problems connected with textiles. Additional work is being done in finding a way to utilize lint cotton to supplement linters for the manufacture of smokeless powder. The Cotton Chemical Finishing Division is working on the development of new and improved chemical finishes for cotton products. The very long and complicated research projects are being set aside at present in order to solve some of the smaller, immediately urgent problems connected with war production. When the time comes the Southern Regional Research Laboratory will take up the job of continued research in a world at peace.

Simultaneously with the develop-
(Continued on Page 23)
Phi Psi Service Flag

Photo by R. G. Hufford
Phi Psi Service Flag Dedicated

Former members of Iota Chapter now in service honored

BY M. D. MOORE, '43

In more than one way Iota Chapter of Phi Psi, located at the Clemson Textile School, has helped and is continuing to help in the struggle to rid the world of war and abolish the menace to Liberty and Democracy. Besides setting aside funds for the purchase of War Bonds, the Chapter has supplied the Armed Forces of the Nation with many capable officers.

Recently, in an impressive ceremony held in the Fraternity Room in the presence of the active members of the Chapter and the Faculty of the Textile School, a service flag made by the members was dedicated and installed. The dedicatory address was delivered by Mr. R. K. Eaton, acting dean of the school and a number of Phi Psi. In his address Mr. Eaton cited the fact that a service flag representing the combined Chapters of Phi Psi during World War I contained one hundred sixty-four stars, seven of which were later turned to gold. He stressed the importance of the fact that already Iota Chapter alone had supplied over half this number in World War II.

Of the ninety-five former members of the Chapter, only one has been reported as a casualty. On February 5 word was received that Lt. C. E. Spires, Class of 1940, had been injured in battle but was recuperating at a base somewhere in England. It is the sincere hope and prayer of the Chapter that Lt. Spires will soon recover and that none of the stars on the flag will ever be turned to gold.

The flag, made by the members of the Chapter, is three feet wide and five feet long and consists of a white field upon which is a blue star for each former member now in the service. The white field is bordered with red silk. Hanging with the flag on the wall of the room is a scroll upon which are the names of the former members and the number of the star which represents each.

It is with great pride and respect that we herein print the names of those former members of Phi Psi, Iota Chapter, who are now actively engaged in the fight to preserve the freedom of this Nation and other peace loving Nations of the World.

The Stars on the Flag number from left to right and down.

L. D. Swearingen '32
H. W. Fogle '32
W. C. Crain '29
J. A. Cook '29
J. C. Childers '30
J. E. Baker '32
J. V. Walters '33
G. E. McGrew '33
D. H. Kennemur '33
E. W. Hollingsworth '33
W. G. Ashmore '33
C. D. Wyatt '34
R. F. Jenkins '34
J. B. Day '34
R. A. All '34
W. W. Webb '34
W. L. Tripplett '34
P. L. Tobey '34
J. R. Thode '34
C. O. Stevenson '34
H. E. New '34
M. L. Huckabee '34
C. P. Gordon, Jr. '34
George Chaplin '35
H. P. Bridges '35
E. H. McCarter '36
T. B. Roach '36
J. C. Ballard '36
W. O. Hankinson '36
J. P. Woodside '35
H. D. Leitner '37
W. K. Lewis '37
R. E. Hilton '37
C. O. Browning '37
S. J. Craig '37
W. H. Cutts '37
T. F. McNamara '37
A. S. Sanders '38
P. R. Abercrombie '38
J. W. Anderson '38
R. R. McGee '38
A. L. Sanders '38
J. W. McSwain '38
R. W. Robinson '38
H. C. Avinger '39
W. E. Dunn '39
R. M. Denny '39
R. G. Carson '39
A. D. Graham '40
J. G. Smith '40
J. B. Frazier '39
C. E. Anderson '40
G. M. McMillan '40
J. H. Radeliffe '39
H. H. Cosgrove '40
J. H. Levin '40
H. H. Thomas '40
F. E. Culvern '39
C. V. Wray '40
J. A. Shirley '40
D. J. Ross '41
G. C. Jolly '41
J. L. Orr '41
H. V. Simpson '41
C. M. Zeigler '40
W. W. Foster '40
C. E. Spires '40
W. R. O'Shields '41
W. H. Carder '41
P. J. Burns '40
R. O. Holcombe '40
F. G. Cash '42
J. D. Christopher '41
G. W. Kirby '41
A. C. Nalley '41
P. W. McAllister '41
G. S. Wham '41
J. W. Howard '41
G. E. Williams '42
H. H. Robinson '41
J. H. Barton '42
H. L. Sturgis '42
J. W. Sullivan '41
R. T. Osteen '41
C. W. Hite '41
W. H. Carson '42
E. A. LaRoche '42
R. S. Berry '42
J. L. Cox '42
W. A. Barnette '42
R. L. Cheatham '42
G. B. M. Walker '38
R. T. Stutts '28
J. C. Brooks '37
Tate Horton '36
Allen Taylor '38
"Cotton Fights On Every Front"

Despite prevailing war conditions, Cotton Week will again be observed this year all over the nation during the period of May 17 to 22. Its main objective will be to enlighten the public to the tremendous contributions cotton has made toward the prosecution of the war. This year, instead of attempting to quicken the sale of cotton goods as in former years, the emphasis will be placed upon the conservation of cotton goods.

The war has increased the versatility of cotton to such an extent that it was decided to lay stress on this factor during Cotton Week this year. The uses that we have put cotton to since Pearl Harbor have shown that cotton products can be adapted to all climates and conditions unheard of before.

The slogan, "Cotton Fights On Every Front", was suggested by Colonel Robert T. Stevens and the poster on this page has been designed around this slogan. Over 400,000 copies of this poster will be distributed to every branch of the cotton industry as well as to civic organizations for display purposes.

The way in which the industry met the unparalleled demands of war was summed up recently as follows: "War has made cotton more than ever the universal fiber. Everywhere in the world cotton has gone to the front with our

(Continued on Page 23)

Here is the proof of the poster for the 1943 observance of Cotton Week. It is an exact reproduction of the official red, white and blue poster selected for this year's event. It can be used in making any size mat or electro that may be needed by those desiring to reproduce the poster design in advertising or other printed material. The full-size three color poster — approximately 16 by 20 inches — will be supplied without charge for display in stores, business showrooms and public places. The poster is adapted from a cartoon by the U. S. Quartermaster Corps.

TEXTILE LIGHTING
(Continued from page 11)

to supply a given amount of power to a mill are proportional to the power supplied and inversely proportional to the power factor at which it is supplied. Therefore, at power factors other than 1.0 the volt-amperes necessary to supply a given active power are greater than the active power itself.

This means that the mill would be getting power that it would not be paying for if the power factor were less than 1.0. Naturally, the power company will try to remedy this situation by barring the use of any equipment which results in the above situation. All reputable manufacturers of fluorescent lighting equipment include the power factor rating with the technical data supplied with the unit.
"COTTON FIGHTS . . ."
(Continued from Page 22)

fighting men. It flies on our planes, rolls with our motors, sails with our ships, covers our guns and clothes and shelters our soldiers. It is at home in the tropics and a god-send in the Arctic."

The merchandising aspect of the event will be concentrated for the most part on the types of cotton goods, apparel and home furnishings that happen to be in fairly liberal supply and on the many products that have been developed to take place of the numerous items forced off the retail shelves by the war.

In normal times, Cotton Week is celebrated in many cotton growing and manufacturing centers with parades, balls and special educational programs in schools and colleges. A recent survey by the Institute indicates that similar events will be held this year with some modifications in towns and cities located in the dim-out belt.

All of these events will be built around the theme of cotton's contribution to the war.

"RENAISSANCE"
(Continued from Page 19)

ment of new laboratories, the various textile promotional organizations are at work fostering this new drive on research. Under the guidance of the National Cotton Council of America we have seen increased research activities in the state universities and colleges of the cotton-growing and producing section of our country. The State of Texas has set up a large research fund for cotton and cotton textiles. The National Cotton Council expects to coordinate the various research programs being carried on by the many textile promotional organizations. Under this plan the Cotton-Textile Institute will handle the research work within the industry itself. From its headquarters here in the Clemson College Textile School the Cotton-Textile Institute will work directly with the mills, helping them solve the various problems which arise directly out of the processing and manufacturing of cotton products. Among these problems we have already seen the development of higher card speeds and the use of cotton blankets on the slasher squeeze-rolls in place of wool blankets. These are examples of the many problems which arise in the mill. The Council also plans to carry on an extensive program in industrial and consumer research. This phase of research which has been neglected somewhat, will assume the duties of finding new markets and outlets for increased consumption of cotton goods. They are carrying on at present an extensive advertising campaign to promote the use of cotton products.

Thus, we can see that textile research is beginning to go places; this, however, is only the beginning! We are sure to see gratifying results in the near future.

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