

An Introduction to Cotton Textiles

What is Cotton?

Cotton is the overcoat of a seed that is planted and grown in the Southern States to keep the producer broke and buyer crazy. The fibre varies in color and weight and the man who can guess the nearest the length of a fibre is called a cotton man by the public, a fool by the farmer, and a poor business man by his creditors.

The price of cotton is fixed in New York and goes up when you have sold and down when you have bought. A buyer working for a group of mills was sent to New York to watch the cottonmarket and after a few days' deliberation wired his firm to this effect--" Some think it will go up, some think it will go down. I do, too. Whatever you do will be wrong. Act at once."

Cotton is planted in the spring, morgaged in the summer and left in the field in winter.

AS PART OF COTTON TEXTILES

The subject TEXTILES presents such a vast number of possible subdivisions, that for the purpose of this discussion this paper will remain in ~~the~~ one of the main channels--cotton. There was a time when cotton was thought of only by way of its end product--clothing, but allow us now know of many of other functions of this important agricultural commodity. Therefore forgetting about silk, wool, wood pulp, jute, manila hemp, to only mention a few, let us to give our attention mainly to cotton, its inherent characteristics, the preparation of it for spinning and weaving, and finally a review of the present day industry together with what the future may hold.

The cotton fiber comes from the seeds of the cotton plant. It varies in length from one-half inch up to two and one half or even three inches, according to the variety and to the conditions under which it is raised. The great volume of cotton in the world's markets averages about an inch in length. When examined under a powerful microscope, a single fiber appears to be flat like a ribbon with a ridge at each side, but instead of lying flat like a ribbon the fiber is twisted many times so that it looks like a spiral. This twist in the fiber, together with the ridges at the edges, helps materially in spinning the fibers into a thread, for the fibers are entangled in each other's spirals, and this makes the thread hard to pull apart with ^{out} breaking. The fiber is composed of a substance called cellulose.

The principal cotton-producing countries in the world are the United States, India, and Egypt, with the U.S. alone producing about six-tenths of the total. As to qualities of cotton, the principal ones are its length, strength, fineness, and color. Other qualities

are considered in the market, such as pliability, regularity, smoothness, and cleanliness. The principal kinds of cotton are Sea-Island, Egyptian, Peruvian, Upland, and Indian. Sea-Island is by far the best, as it boasts long fiber, silky appearance, and fine color, and is used in sewing thread, lace, fine muslin, and silk mixtures. Egyptian comes next in quality with vast quantities imported to this country every year to be combed and spun into yards for fancy cotton knit goods. Peruvian Cotton has a fiber almost as long as Egyptian, but it ~~is~~ harsh and wiry and hence it is used very generally in the manufacture of wool mixtures. Brazilian cotton is similar, although rather less harsh and woolly. Upland Cotton, the general American type, comes next in quality, having a shorter fiber (poor cultivation and soil produce a shorter fiber), although this type furnishes most of the supply for the great staple lines such as gingham, galicoes, sheetings, and shirtings.

The above are generalizations covering qualities of the main types, however, as is the case ~~in many~~ ^{A GREAT INDUSTRY} when trying to skim over, there are many variables entering the picture. Soil, Climate, Methods of cultivation all tend to affect fiber. For although, we have mentioned that Sea-Island cotton is the best, a certain part of even this kind of cotton that comes to the great cotton markets of the world sells for less than good American Upland Cotton, when as sometimes happens, the former is of poor quality, or in damaged condition. Egyptian cotton too, when it comes from the upper part of the Nile Valley is no better than the India Cottons. Quality of fiber ^{and yield} is steadily being improved by better methods of cultivation. Moreover, the introduction of Sea-Island Cotton in our Southern States is giving us a better cotton than the common Upland type.

From the field the cotton is brought to the gin where cotton is split into two major channels. We can follow from here, either the cottonseed or the fiber; we will follow the fiber. It might be said here that from

one hundred pounds of cotton one finds about 66 pounds of seed and about 34 pounds of fibers, or lint.

Grading cotton is of the utmost importance in both marketing and manufacturing. The usual method by the buyer is to cut a slit thru the bale wrappings, and pull out a handful. At this point, sight, touch, smell, length and consistency, ^{and} breaking strength of the fiber are all considered. The sample is usually viewed by a good north light, and allowed to dry, which permits any foreign matter to free itself. Seven-percent of ^A bale's weight is usually ~~xxxxxxx~~ ^{allowed for} covering such as burlap, and steel strap. After the length and strength have been established, the degrees of color, luster, and cleanliness give rise to 13 distinct grades, which we will be unable to elaborate upon in this paper. We should add however, that every cotton crop is more or less distinctive in character. One crop may be very bright and white, another creamy, another dingy. Hence when one hears that a crop is of good color it may mean that it is not necessarily white, but it is not discolored by being spotted, or stained. Buyers will grade differently, ^L and supposedly standard grades will vary from different suppliers. For instance 1st Cut Linters from one house will not insure one of that same grade if 1st Cut Linters are ordered from a competitor: therefore, always request a sample and do your own grading.

PRICE

~~Value~~ of the various grades varies with the demand and supply ~~of~~ for the specific grades. For instance, Peeler Comber invariably sells above ^R ~~A~~ Strips, and 1st Cut Linters. Today, with a heavy slump in Chenille products which drew heavily on Peeler Comber, we find Comber selling below Strips and some 1st Cut Linters. From the samples shown one wonders how Comber could sell below Strip, or Linters.

Having decided upon the proper grades, cotton undergoes many long and interesting processes before it is finally turned into suitable consumer goods. The principal processes are spinning, weaving, dying, and finishing. The process of spinning is essentially nothing more than

taking the loose, tangled fibers, drawing them into a smooth, uniform thread, and twisting the thread to give it strength. After the bales are broken, the cotton is then run through machines which clean, mix, and lay the fibers approximately parallel, called carding. The cotton is then drawn out into a filmy layer and contracted into a light round cotton rope about an inch in diameter called a sliver. The Slivers are then wound spirally into a Sliver Can. To give additional refinement to the cotton, it may be run through a Combing machine which simply does more perfectly the carding operation. The usual combing method consists in taking several cans full of Sliver to the machines, and running them through another series of rollers which removes more short fibers, foreign material, and again leaves the fibers ~~xxxx~~ parallel ~~xxxxxxx~~. Slivers are again the end product. The Slivers then are ready for Drawing. About six Slivers are introduced to the Drawing Frame at one time, and so draws them out that the resulting sliver is no larger than ^{THAT} of the originating Slivers. Most cotton is ~~xxxx~~ run through the Drawing Frames three times. Yarn usually leaves the spinning mills on bobbins, tubes, or cones and is ^{thus} sold.

For purposes of making cloth, two classes of yarn are spun, namely a loose, slightly twisted yarn for the filling, not requiring much strength, and a hard twisted strong yarn for the warp. Since the warp threads must undergo the more handling and strain, they are usually made from longer fibers, while the shorter fibers are employed for the filling threads.

In weaving, the Warp threads are usually sized to withstand the strain and friction of weaving. ~~The number of filling or weft threads determines the width of the cloth to be run, and the thread count desired.~~ At the back of the loom, a beam is placed which holds the warp thread, and the number placed thereon will be dependent upon the desired thread count of the cloth, and the width to be run. The shuttle which carries the Filling

threads then flies back and forth depending again upon the thread count of cloth to be produced.

Let us now turn to the three broad divisions of cotton cloths. We find first, Gray Cloths. These are woven ~~into~~ ^{WITH} unbleached yarns, and although, they are used mostly for converting into finished goods, considerable quantities are used in the gray state. Next, we have converted cloths, that is, gray cloths converted by bleaching, dyeing, printing, and finishing. Most of the cotton fabrics made have to be converted before they can be used. Finally, there are the Colored Woven Cloths. These are made with colored or dyed yarns and are made ready for use by the mills weaving them.

There are a multitude of fabric names, but basically there are only four groups. First, there is the Basic Gray Cloth names ~~xxxxxx~~ that retain the same name after converting, namely, broadcloth, and poplin. Next, there are the Converted Cloth Names. These cloths are named after finishes given them or are known by trade names which indicate their use, for example, print cloths can be converted into finished cloths such as printed percale, muslin, crash, cretonne, canvas, etc. Then there are the Colored Woven Cloth Names, which ~~xxxxxx~~ have basic fabric names such as denim, covert, and cottonade. Lastly, there are those cloths which are named after fancy weaves or weave effects used in them, such as ^Alppet-embroidered lawn, doobby-woven blip-cover fabric, honeycomb toweling, and waffle pique.

Weaves used in cotton cloths include the three foundation weaves, plain, twill, and satin.

The majority of staple cotton fabric, however, are plain woven. ~~At~~ A wide range of textures are made in the plain weave, varying from sheer lightweight organdies to heavy ducks and blankets. Thread constructions range from low-thread-count tobacco cloths of 20 threads per square inch to high-thread-count typewrite ribbon fabric of 350 threads per square inch.

With reference to the relative strength of woven fabrics, everything

else being equal--yarns and total number of thread per square inch--a plain-woven cloth is the strongest because it has more interlacings or binding points than a twill or satin woven cloth. However, it is possible to weave more threads per square inch in a twill weave because there are fewer intersections, and this is the reason why a twilled cloth is usually stronger than a plain cloth. Satin-woven cloths produce a long float, smooth and free from pronounced twill lines, with fewer binding points, and give a smooth soft, highly lustrous effect in the finishing, especially in filling sateens and table damasks.

As a general rule, warp faced cloths, which have considerably more warp threads than filling threads, are stronger and more serviceable than filling-faced cloths. On the other hand, filling faced cloths, which have considerably more filling threads than warp threads, give a higher finish in the finishing operations. This is because the filling yarn is softer than the warp. Warp-faced cloths are found in overalls, work pants, suitings, and shirtings where service is required. Filling-faced cloths are used in underwear and linings where softness, smoothness, and luster are necessary.

Woven cloths of 12 in. and under are known as narrow fabrics and are made on narrow-fabric or ribbon looms, which weave several at a time. Cotton cloths run from 13 in. wide up to wide sheeting and duck widths of 144 in. and, in special cases, up to 244 in. The width is usually stated in inches; but, for wide bed sheetings, it is also expressed in quarters of a yard.

Unbleached cotton goods as they come from the loom are known as gray goods. They are also referred to in a few instances as brown. Gray goods are bought and sold by the name, width, construction (thread count per inch) and weight. They are distinguished also as being carded or combed. The weight is usually quoted in running yards per pound; but for heavier fabrics, such as ducks and Osnaburgs, the weight is expressed in ounces per running yard. In special fabrics, in which equal breaking strength in warp and filling is required, such as in tire fabrics, the weight is expressed in ounces per square

yard.

Returning to cloths, the two common types, Print Cloths and Sheetings bear additional discussion. Print cloths are carded cloths made with the same yarns as cheesecloths but with more warp and filling threads per inch. Print cloths are converted into more different finishes than any other gray cloth. Millions of yards of these staple cloths are converted into printed percales, and white goods finishes such as cambric, muslin, lawn, and longcloth. Very large yardages of these cloths are also used in the gray state by the bag trade for grain and feed bags. The chief difference between print cloths and sheetings is that sheetings are made with heavier yarns. Percale sheets which are merely a type of finish given to sheetings are either combed or carded. Combed percale sheetings are the finest and most luxurious because of the combed yarns used are of long staple cottons, and have a soft and silky finish. The construction is from 180 to 200 threads per inch. The finer percales are called supercale.

From the short discussion given thus far we can see that one could give considerable study to any one of the number of avenues that might have been followed in the preparation of fabrics. One outstanding industry within the textile industry is that of chenilles, which has had a phenomenal growth. The center of the chenille industry is Dalton, Ga.

"Bedspread Boulevard". That's how the highway from Dalton, Ga. to Chattanooga is referred to today. And all because in ¹⁹⁰⁰~~1900~~ a Georgia farm girl named Catherine Evans sold a hand made beadsread for \$2.50.

It's a vertiable rags to riches story, because Dalton today is the beadsread center of the world, and the cash jingling in the folks' pockets there can be traced in large measure back to Catherine Evans and the ingenuity and the enterprise of the women who emulated her example.

It was in 1892, so the records show, that Catherine, aged 12, living with her parents on a farm near Dalton, so admired a beautiful tufted beadsread which one of her cousins had inherited that she determined to make one like it. She set to work. Three years later the spread was completed. The following year she made another as a wedding gift for her brother. Five years later, she made her first sale. Mrs. John Lee of Trion, Ga., bought a spread from Catherine for \$2.50.

There was no candlewick yarn in those days; Instead, Catherine Evans used a single strand cotton, doubled to the required thickness to make a tuft. It took patience, and it required hard work. But it paid off.

Word spread rapidly of the beauty of these spreads, made by hand by a Georgia farm girl. Other sales followed. In a few years Catherine found herself an employer with many helpers working swiftly to produce tufted bedsreads to meet a growing demand.

Nevertheless, for two decades, the manufacture of tufted bedsreads remained strictly a home industry, although a growing one.

It was in 1921 that Mrs. G.M. Cannon, wife of a Dalton retail store operator, went to Cleveland, Ohio, to buy ready-to-wear for her

husband's establishment. The head of the wholesale firm there, learning that she was from Georgia, told her that his wife on a recent visit to Texas had purchased a bedspread made by Miss Catherine Evans and that she and a group of her friends had so admired the workmanship that they had ordered a number of additional spreads to be sold in their church circle.

Thus, quietly but importantly, was launched the industry that was to bring a veritable economic revolution to a sizeable segment of the Southeast.

As a result of her conversation with the Cleveland wholesaler Mrs. Cannon and a salesman, George Sorrick, decided to enter the tufted bedspread industry and to make it really pay.

Their first order was for 100 spreads.

Mrs. Cannon gave the spreads the name Colonial Candlewick Spreads, recalling that during Colonial days housewives made their own wicking for candles and used this same wicking for purposes of embroidery. This firm--first real commercial venturers into the field--became known as Cannon & Sorrick, distributors of Colonial Candlewick handmade bedspreads.

The wife of a dentist who bought one of the spreads persuaded the fabulous John Wanamaker to try half a dozen of those made by Catherine Evans. Thus they were introduced at New York. It was the "rage" which followed that awakened the menfolk of the Ga. community to the commercial possibilities.

A Dalton freight agent quit his job quickly to begin manufacturing tufted bedspreads in a spare room in his own home. Not long ago his business had soared to more than a million dollars a year. A Dalton housewife began production in the backyard of her residence with only one other woman to help her. Later she enlisted the help of her husband and organized the J.T. Bates Co., which not long thereafter,

moved into permanent quarters with more than 300 employees.

From then, progress was rapid. In nearby Calhoun, Ga., a dentist gave up his practice to devote his entire time to bedspread manufacture when his wife's income from doing just that surpassed his own. He started in a single room in his home: by 1939 he was shipping 12,000 candlewick bedspreads at a time to wholesalers. In 1922, two sisters, Miss Mamie Redwine and Mrs. Etta Strain, hired six employes and began making bedspreads. ^oSoⁿ they ~~were~~ employed well over 200 persons. Another Daltonian who began bedspread manufacturing in a single room with the help of four employes saw his business grow to such an extent that four years later he occupied a building with 35,000 sq. feet of space and had 450 employes on his payroll.

And so the industry grew until today, according to Henry C. Ball, executive director of the Tufted Textile Manufacturers Ass'n., there are approximately 400 plants in 24 states with 25 machines or more making tufted chenille products. About 75% of the total production, however, is within a 125 mile radius of Dalton. He^{re} is a Southern-born, Southern matured, Southern-concentrated industry.

If the women started this industry, the men saved ^{it} by mechanizing [^]it. The first chenille machines were developed early in 1930's to overcome price and demand problems. Today these machines can turn out more tufting each than can several hundred hands.

Some idea of the tremendous growth and importance of the industry is given by Mr. Ball in a special report he compiled. In 1940 the total dollar volume of the industry--including bedspreads, rugs, and robes aggregated \$23,000,000. In the 1941 this figure rose to \$29 million. It was \$28 million in the 1st quarter of '46; \$32 million for the 2nd quarter, with an estimate of \$121 million for all of 1946!

From a handful of employes in its infancy, the tufted textile industry

grew to 9800 in 1940, soared to 18,700 during the 2nd quarter of 1946. Of the total dollar volume this year, the tufted bedspread division will do about \$69 million, the rugs division about \$30, million, and the robes sector about \$22 million. As to units produced, 1946 production shows a 201 % increase over that of 1940.

Actually, the chenille industry has had its greatest expansion during ~~the~~ ^{THE} last five or six years. Today ~~one~~ finds on the market not just chenille bedspreads, robes, and rugs but tufted textile bathmats, seat covers, beach and sports wear, draperies, crib spreads and numerous other items to add enjoyment to living. Laundries have been erected to wash and fluff the chenille products--a task once performed by hand. ~~Today~~ ~~is~~ During the early years of bedspread manufacturing only white yarn was used. Today dye plants have sprung up, and combination colors have become popular.

The versatility of the industry was evidenced during the war. Plants in Ga. and elsewhere turned out barracks bags, airplane wing covers, shelter halves, bomb parachutes, WAC uniforms. In January 1945, the industry was completely closed down by the government as a result of its order freezing all yarn and sheeting. These were lifted in 1946.

All signs now are hopeful for the industry. Multi-needle machines are beginning to appear in increasing quantities. The latest type is one of 185 needles which will accommodate an entire large size bedspread, and ~~with~~ its use five men can turn out 800 chenille bedspreads daily. Today enough people find employment in Dalton to compose an army; ~~though~~ thread is used to hemstitch the Milky Way; the cloth used is sufficient to make a tent large enough to accommodate a sideshow for the Seven Stars, and in as many colors as will be required to embellish beautiful sunsets for an Indian Summer."

The chenille industry ~~is~~ thus shows but one of many fascinating stories within the textile ~~industry~~.

Let us now give some attention to recent economic developments in the cotton textile industry.

Cloth and cotton prices have followed the composite pattern of prices. Witness ~~cotton~~^{cotton} in the thirties of 5 to 15¢ per pound; today^{it} is above 30¢, and was close to 40¢ since the lifting of price restrictions. Cloth, that is, 30/80 in the gray, was 67¢ per yard on Feb. 20, 1940, the last OPA price was 19.7¢, and is currently about 35¢ for spot delivery. Mill labor received ^{AN AVERAGE OF} 36¢ an hour in 1939 and today is getting practically \$1.00 per hour on the average. Production-wise, it is noteworthy that there was an 8% increase in broad woven cotton goods during the final quarter of 1946 when 2,354,800,000 yards of goods were turned out, which brought output for the year to 9,103,000,000 yards. Production efficiency is reflected inasmuch as 15 million spindles have been junked since 1925.

Recognized authorities in the textile trade look for a price adjustment sometime during 1947. There is now evidence of a softening in demand in the soft goods lines such as food, clothing, and the like, and more of our total income is going ~~into~~ durable goods such as automobiles, and the like. Although there are more sheets and pillow cases now available, there still remains a tremendous demand for these items. Some mills are currently selling into the 3rd and 4th quarters of this year, who normally sell 60 to 90 days in advance. Inasmuch as attention is already being given to the depleted export market, we should look at our foreign competitors who are crowding our top position in the textile world. In Canada, the long-range prospects are beclouded by uncertainty about governmental tariff policy. As at the end of 1946, the industry was under control both as to prices and production. In Mexico, the conclusion is that while textiles remain in large demand all over the world, foreign competition will not be strongly felt. Brazil's textile industry has experienced great expansion during the war years. Her exportation of cotton goods has moved from 19,000,000 meters in 1939 to 242,000,000 meters in 1945, which was 22% of her production. Cotton cloth production in Argentina has just about doubled in volume since 1939. China's 1946 production of cotton cloth was approximately 720,000,000 ~~mill~~ yards, while 1947 is expected to show 1,200,000,000. In India, where cotton is king of the textile industry despite the magnitude of local jute production, a doldrum period has set in. Their 1946 production was 18% under the wartime peak, the reasons being that the work week has been reduced from 48 to 40 hours, and numerous strikes. However, an ambitious expansion program has been designed. Japan's textile industry is an enigma to most of the world, as American military authorities are now calculating on the extent to which Japan will be allowed to rebuild that industry. Of Japan's 13,000,000 pre-war cotton spindles, about 2,500,000 are now operable. The United Kingdom's cotton goods production for 1946 has fallen far behind, as it was only one-third of that produced in 1941. For the 1st ten

domestic months of 1946, 32% of its cotton goods production was exported. Although textiles are not among the six major industries in France, their improvement from their present dismal state lies in the need for the restoration of clothing supplies, and the contribution they can make to the French export trade. Holland's textile industry is well on its way to recovery. The Swiss production for 1947 is expected to improve over that of 1946 because of betterment in its labor and raw material situations. Figures on Russia are incomplete although it is known that 140 mills of the 400 damaged during the war are fully or partly restored. Cotton goods is the big division of the Russian textile field, and plans are for a 5,000,000,000 yard production by 1950. Australia's textile industry ^{MADE} ~~made~~ excellent production records during the war due to 2 and 3 shift operation [^] which previously ran only one shift. Prewar, Australia produced only 2½% of her consumption, while during the war she upped her production fivefold. Japan's cheap cotton goods held back Australia's production in the prewar years.

Our outlook for export business is beclouded. The quota system prevails and no opinions are found as to what may happen towards tariffs with 18 foreign countries scheduled to ^{meet} ~~meet~~ this month for tariff discussions.

Domestically, two supports will ~~lend~~ continued strength to cotton-cloth output for 1947: one is a war-built backlog of U.S. textile needs equal to a half year's production, and the other is a foreign market shorn of half its prewar cloth supply. The domestic inventory backlog may now be partly made up, and world output is on the rise; so it is easy to make too much of either backlog or exports taken singly. Finally, a variable which may affect the textile picture, which we have not touched upon in this paper is that of ^{MAY} ~~made~~ atomic energy. How this ^{MAY} ~~made~~ influence your wife's dress, or your suit of clothes, I will leave for your imagination.