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TEXTILES

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TEXTILES

The selection of materials necessitates a knowledge of the fiber of which the fabric is made, the methods of manufacture, ways of adulteration and the tests for determining the choice of the material to be used. Each fiber has characteristics which make it peculiarly adapted to certain uses.

COTTON

Cotton is the most commonly used fiber as it enters into nine-tenths of the textile material of every day use. It is of vegetable origin and has short, flat fibers with spiral twist which make it able to be spun into fine thread.

Cotton fabrics show the following characteristics:

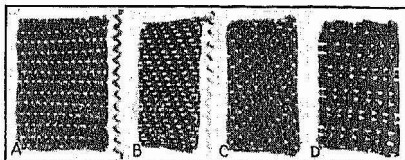
1. Good quality materials are strong and durable.
2. Unsized cotton is soft and pliable.
3. Dirt adheres to cotton as it has a fuzzy surface and contains a natural oil which catches dirt quickly. Therefore it soils quickly.
4. Cotton is laundered easily. It can be boiled without injury to the fiber. It takes starch well, so it can be kept looking fresh.
5. Acids destroy the fiber. (If acid is used in removing a stain, wash thoroughly.) Perspiration will injure and weaken cotton cloth.
6. Cotton takes up dye but not as readily as silk and wool. All yarn dyed materials hold their color better than piece dyed or printed goods.
7. When tightly woven, cotton is a good conductor of heat so is valuable as a summer fabric. When loosely woven, as in knitted wear, it conducts heat less rapidly, therefore it is used extensively in winter underwear. The napped surface of outing flannels and cotton blankets makes the material a poor conductor of heat and so are warm while new. When nap is flattened it loses some of its warmth.

Weave

All materials are made of two sets of threads woven over and under each other in some method. The threads which run lengthwise of the material are called "warp" threads; while those which run across the cloth are filling or "woof" threads. Where the filling threads turn to go across the warp threads a firm edge is made. This edge is called the "selvage."

Kinds of Weave.

- (a) Plain Weave
- (b) Twill Weave.
- (c) Satin Weave.
- (d) Variation Weave (basket)



1. *The plain or tabby weave* (a) is the simplest kind of weaving. This is made by passing filling threads through the warp in regular order, alternately going under and over a thread until the selvage is reached, when it turns and goes back, passing under the thread it passed over in the previous pick. This makes a strong firm cloth.

Example: Muslin.

2. *Twill weave.* In the twill weave (b) the warp threads cross over and under the woof in a regular variation, sometimes over one thread and under two threads, or over one and under three, the filling moving forward in a regular progression of one. This gives a diagonal effect to the cloth. Twills are firmer and stronger than plain weaves.

Example: Denim.

3. *Satin and Sateen Weave:* Satin weave (c) is somewhat like twill, but no trace of twill may be seen on the cloth. A filling thread is made to pass under one and over from six to twelve threads. The interlacing is done at irregular intervals, thus preventing a twill from showing. The terms satin and sateen are both used for this weave. If the filling is brought to the surface it is called sateen, and if the warp is on the surface it is called satin weave. A thread which passes over several threads is called

a "float." Strength of this weave depends somewhat on the size of the float. With long floats the surface is apt to rough up.

Example: Sateen.

4. *Variations.* The plain or twill weave is often changed in some way (d). Sometimes the two kinds of weaves are used. It takes more time and work to weave these, which increases the cost. Strength varies according to the weave.

Examples of the variations: Dimity, poplin, pique, monk's cloth.

Finish.

Cotton materials depend greatly on finishing for their effect and the resemblance of cotton to other textiles is principally a matter of dressing and machine finishing.

1. *Sizing.* (filling, weighting) is material added to cloth in the finishing processes to give it body. Various substances are used, including starch, glue, clay and glycerine. All cotton materials have some sizing to keep them in good condition while being handled in the shops. Excess amounts of sizing are often added to give firmness and weight to inferior material.

2. *Mercerization* is a process in which cotton is treated chemically to give the fiber a silky luster. The cotton, either the yarn or cloth, is stretched over rollers and run through a bath of strong, cold, caustic soda solution, after which it is rinsed in water and dilute acid. Mercerized cotton is more expensive than ordinary cotton but is heavier, stronger, and more silky looking and gives very good service. The luster is permanent and mercerized cotton takes the dye more readily than ordinary fibers.

Adulteration.

Cotton, being the cheapest of all materials, is never adulterated with other fibers but the cheaper grades are "sized" with starch, glue or china clay to give appearance of a heavier and firmer fabric. Heavily "sized" cotton does not launder well. Imitation dots or designs are pasted or printed on this cloth and come off in the laundering or turn brown when ironed.

Tests.

1. *Test for Sizing.* If a heavy cotton, tear or rub vigorously and if a fine dust appears, you will know it has been sized. If

a light weight cloth, hold up to the light and look through it. If heavily sized, you can see it between the threads of the weave. Boil a sample of material you think is sized. Washing will remove the sizing, leaving the material with body and showing loosely woven cloth of poor quality.

2. *Tests for Method of Dyeing.* There are three methods of dyeing—yarn dyeing, piece dyeing and printing. The yarn dyed cloth is much better.

(a) Ravel out threads; if of one color, it is yarn dyed. Chambray and gingham have the same color on both sides of the goods.

(b) When ravelled threads show white specks the cloth has been "piece" dyed.

Example: Galatea, percaline.

(c) When threads are mottled or dyed in spots it has been printed. Good printed material should show the distinctness of pattern on wrong side.

Example: Percalé, cretonne, calico.

3. *Test for Color.* Wash a sample of material several times and hang in the bright sunlight to dry. Place it beside the unwashed sample.

4. *Burning test.* Ends of cotton threads spread out when burning. It burns readily, leaves a fine gray ash and has an odor like burning leaves.

Suitability of Cotton Materials to Garments and Household Uses

1. *Undergarments.* Nainsook, long cloth, dimity, Berkley cambric and finer grades of muslin. Plain white material is always preferred.

2. *Aprons.* Percalé, gingham and better grades of calico, unbleached muslin, Japanese crepe.

3. *Dresses.* (Simple type). Chambray, gingham, percalé; (Dressy type) Voile, organdie, batiste, French gingham, dotted swiss, dimity, poplin.

4. *Separate Skirt.* Indian Head, pique, gabardine, drilling khaki.

5. *Middies.* Drilling, galatea, Indian Head, poplin, khaki.

6. *Household Uses.* Indian Head, crash, unbleached muslin, used as a substitute for linen in table linens and scarfs.

LINEN.

Linen was at one time the most important vegetable fiber and was used commonly for all household purposes, but now it is called the "textile of luxury," as its expense stands in the way of its common use. Linen is of vegetable origin and the fibers are long, smooth and quite lustrous when spun into a thread. It does not have so many fuzzy ends as are found in cotton.

Linen fabrics show the following characteristics:

1. Strong and durable.
2. Cool, and has leathery feel.
3. Snowy white when bleached.
4. Does not take dye readily and fades quite quickly in both sun and water. Therefore it does not retain stains as persistently as cotton, making it of value as table linen.
5. Wrinkles easily.
6. Not affected by dilute alkali solutions. Not affected by acids as easily as cotton.
7. Absorbs and gives up moisture, making it of value for towels.
8. Is smooth and glossy when laundered.
9. Because of long, smooth fibers it keeps clean longer than cotton.

Weaves.

The typical weaves in linen are plain weave for clothing and coarse crashes; damask, satin or sateen weave for table linen and towels; Huck, an uneven weave, is best for toweling as it gives a good surface for absorption of water.

Finish.

If the linen is of good quality, not much dressing is added, as the luster of the flax may be brought out in beetling and pressing. Cheap, poor linens are, however, often loaded with foreign substances, such as starch, clay or wax.

The beetling process is used to give gloss to the surface and also the leathery feel, which is characteristic of good table linen. It flattens and closes up the threads and produces a luster.

Adulteration and Imitations.

1. Mercerized cotton, because of its gloss, often is sold as linen.

2. Cotton, when treated with magnesia, gives a cool feel resembling fine linen.

3. Sizing is used to make inferior linen appear a better grade.

4. Cotton yarn is spun to imitate linen yarn and is then woven into linen weaves and sold as linen.

Example: Cotton crash.

5. Cotton is woven with linen as in linen and cotton huckabuck, and sold for all-linen.

6. "Union" cloth: made of part linen and part cotton, sold for towels, tablecloths, sheets and dress fabrics. It is hard to care for and is not as durable as all cotton or all linen. Not as objectionable in towels as in tablecloths.

Tests.

Linen is hard to distinguish from cotton, especially when heavily starched and given a good finish. Because of its cost do not depend on one test but try them all so you will have no doubt as to the fiber.

1. *Oil test.* Remove sizing by washing. Place a drop of oil on the cloth and press between blotting papers. Place sample on dark surface to show the effects. Linen becomes transparent; cotton remains opaque.

2. *Sizing test.* Sized linen feels harsh and stiff. Unsized linen feels leathery, soft and flexible. Test for sizing by rubbing vigorously or boiling.

3. *Ink test.* Place a drop of ink upon cotton and upon linen which is free from sizing. Linen absorbs the ink readily while the ink stands upon the surface of the cotton a few seconds before it is absorbed.

4. *Burning test.* Linen burns more slowly than cotton and

the ends stand erect and compact while those of cotton spread out in every direction.

5. *Breaking test.* Ravel out threads and break. Linen is more difficult to break than cotton. The end of a linen thread remains straight, the end of a cotton thread curls up.

Suitability of Linen Materials to Garments and Household Uses.

Dresses. Handkerchief linen, butcher's linen, dress linen, unbleached linen.

Skirts. Linen crashes, butcher's linen.

Household Uses. Table linen-damask; Towels-husk, damask, crash; Table and dresser scarfs, doilies—butcher's linen, crash.

WOOL.

Wool is the second most important commercial fiber. It is particularly suitable for clothing and household uses, because of its nature. It is of animal origin. The fibers are round, wavy, and covered with small scales. The waviness gives it elasticity and this, combined with the scales, which cause the fibers to cling together, enables it to be spun into fine yarn. Under heat and pressure it mats together into felt.

Wool fabrics show the following characteristics:

1. Absorb great amount of moisture without seeming wet.
2. Very elastic; wrinkles shake out of all wool easily where they will not out of cotton and wool mixtures.
3. Difficult to launder; very hot water and sudden changes in temperature of the water cause it to shrink. Strong soap makes it harsh.
4. Wool dyes easily, and usually holds the color well.
5. Not a good conductor of heat, therefore valuable as a winter fabric.
6. Scorches easily.
7. Wool materials are divided into two classes, woolens and worsteds, and are distinguished in the following ways:

Woolens: In woolens the fibers are short and when made into yarn they cross and are matted and intermixed. This makes

an uneven and irregular yarn. Finished woolen material is soft and the weave is not always distinct.

Worsted: In worsteds the fibers are long and when made into yarn they lie parallel. This makes a fine, even and wiry yarn. Finished worsted material is firm and well woven. The weave is well defined.

Weaves.

The plain and twill weaves are most commonly used in making woolen material. Usually effects are gained by yarns twisted in novel ways, by combining other fibers with wool and by finishing and dressings applied after weaving.

Examples of weaves.

Plain—flannel.

Napped surface—broadcloth

Twill—serge.

Satin—Prunella.

Finish.

The final finish to cloth is given by steaming, cleaning, pressing and brushing, all used in varying degrees.

Woolen goods when taken from the loom is coarse, rough and dull looking and the beauty of it depends upon the finishing processes.

Worsted goods when taken from the loom look much as in the finished state, as the beauty of it depends upon the weave.

Adulterations.

Wool materials are cheapened and adulterated by using cotton, shoddy and waste wool.

Cotton with wool is not always an adulterant or a disadvantage. Cotton and wool mixtures in material which must be laundered, such as underwear, frequently give very good service, as the percentage of shrinkage is less than in all wool. Certain materials as alpaca, brilliantine and mohair always have cotton warp and give excellent wear. Cotton with wool is a disadvantage in suits and skirts as such mixtures require frequent pressing. They do not hold the color as well as all wool.

Ways in which wool is usually adulterated are:

1. *Cotton used with wool.*
 - (a) Cotton fibers spun with wool.
 - (b) A wool and cotton yarn twisted together before weaving.
 - (c) Cotton warp and material with all wool filling or only a part.
 - (d) Cotton foundation with wool felted on the surface as is found in cheap coat materials. These soon wear threadbare.

2. *Shoddy or remanufactured wool.* This is made by reducing old wool to the fiber state. It may be made into cloth and sold as new wool or it may be mixed with new wool or cotton. Its serviceability depends on quality of the waste from which it comes and quality of new wool with which it is mixed. Shoddy extends the use of wool and is legitimate because it reduces the cost of warm clothing.

3. *Finish* is often applied to the surface of cheaper woolen fabrics to give a temporary luster.

Tests.

Feeling test. Wool feels warm and springy.

Fiber test. The threads pull apart rather than break.

Burning test. Wool burns slowly, chars, has odor of burned feathers and leaves black ash in the form of a ball.

Lye or caustic potash test. Two tablespoonfuls of fresh household lye to one pint of water. Cover sample in this solution. Wool will become jelly-like in a few minutes and will entirely dissolve in 5 to ten minutes. Cotton is not affected.

Suitability of Wool Material to Garments.

Dresses. Woolen, Challies, broadcloth.

Worsted: Serge, tricotine, Poiret twill, Prunella cloth.

Suits and Coats—Woolen: Broadcloth, velour, duvetyne, home-spun tweed, Bolivia cloth.

Worsted. Poiret twill, serge, tricotine, gabardine.

Infants Clothes. Flannel.

SILK

Silk is often called the fiber of luxury. It is the most expensive to cultivate but the most beautiful and the strongest fiber. Silk fibers are obtained from cultivated and uncultivated cocoons.

The fiber from cultivated cocoons varies in thickness and length and when it comes off in one long, smooth, lustrous thread, it is called reeled silk. If the fiber is short, as it will be from the imperfect cocoons or cocoons broken in the reeling process, it is made into spun silk.

The fiber from the uncultivated cocoon, known as wild silk, is rougher, coarser, and darker in color than the cultivated. It is difficult to bleach and dye so it often is used in natural shades, as in pongees.

Characteristics:

1. Poor conductor of heat.
2. Strong when pure, wears well.
3. Scorches easily.
4. Injured by high and sudden change of temperature. This necessitates washing silk materials in lukewarm water and pressing or ironing with moderately warm iron.
5. Sheds dust and dirt quickly.

Weaves.

Except for some special materials the processes of weaving silk are similar to those of other textiles.

Examples of weaves are:

1. *Plain.* Japanese, pongee, taffeta, crepe de chine.
2. *Twill.* Serges and foulard.
3. *Satin.* Messalines and satins.

Finishes.

The general aim of finishing silk material is to increase the luster and also to improve the cloth. The best silk fabrics require little dressing and are finished by pressing. The poorer, cheaper silks and half-silk materials are immersed in dilute acids to give a glossy surface.

Adulteration and Substitution.

The effort to cheapen silk has tended to develop numerous.

processes which give effects that pass for real qualities with the ordinary consumer.

1. Cotton is woven with silk as in cotton backed satin and velvets.

2. Mercerized cotton is sold as silk.

3. Cotton thread spun with irregularities to imitate the yarn of wild silk which is found in pongee.

4. Typical silk patterns, as brocade designs, are found woven in cotton and sold as silk.

5. Cotton, linen or wool used as fillings in corded silks and poplins. This is not a disadvantage unless the filling is too heavy and in this case the material will split.

6. Weighting—Silk has a property of absorbing metallic salts, such as iron and tin in solution, increasing its weight and making fabrics with a desirable texture but poor wearing qualities. Taffetas and stiff silks are weighed more than soft silks.

7. Artificial silk—A product of modern chemistry. It is made from cotton or wood pulp which is so treated chemically that the product is long, lustrous threads. It has a higher luster than real silk, is wiry, and inelastic. It does not stand moisture as well as real silk. It is used for hosiery, ties, sweaters, embroidery, baronette satin, tricolette, and novelty materials.

Tests:

1. *Burning.* Silk burns much like wool, only more rapidly, leaving a black residue. When heavily weighted the burned fabric retains original shape of piece of material, slightly smaller than the sample. This residue is the weighting which does not burn easily but crumbles at the slightest touch. The larger the residue the greater the adulteration.

2. *Feeling.* Smooth, cool and very elastic.

3. *Tearing.* Plain silk tears with a shrill sound and leaves a rather clean edge. Ravel threads and examine for silk one way and cotton the other.

4. *Wearing test.* To test, press the two thumbs together on the cloth and pull the material straight out—first warp way and then filling way. If it tears or frays in either direction it shows lack of strength. To test for strain in seams, see if warp

or woof threads move easily or if soft and brittle. Also test by weaving a needle in and out of the double of the material as if making a tuck. Draw single cloth away on both sides of the needle. If row of holes show clearly along side of the needle, the material will not bear strain.

Suitability of Silk Material to Garments.

Undergarments. Crepe de chine, Japanese silk, wash satin, pongee, tricolette, jersey silk.

Dresses. Taffeta, crepe de chine, satin, canton crepe, messaline, foulard, poplin, faille.