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EC474 Fabrics Old and New : Part I. What They are Made of

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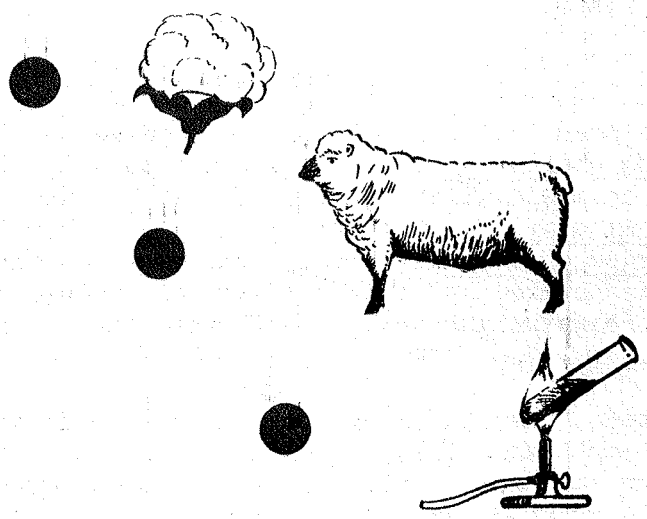

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FABRICS OLD AND NEW

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Part I. What They Are Made Of.

Do you know what kind of fiber or fibers were used to make the cloth in the dress or suit you are wearing? How was the cloth made? Will it wear well, and can it be easily cleaned?

The making of cloth has changed much in the past twenty-five years. New fibers, fabrics, and fabric finishes have come into common use. Many of us are puzzled when we buy yard goods or clothing. We may need to review some facts about fibers and fabrics before we can choose wisely. We may also need to be reminded of what information to look for, or what questions to ask so that we can choose a fabric that is right for the use we intend to make of it.

Fibers From Which Fabric Is Made

All fabric is made from some kind of fiber. Some come from nature, others are man made, and form the group called synthetic fibers. Each fiber has certain characteristics that make it different than the others, and affect the quality of cloth made from it. There is no one perfect fiber, but each fiber has certain desirable qualities, and certain qualities which limit its use or make it less desirable for some purposes.

Sometimes fabric is made from only one kind of fiber--more often two or three or even more kinds of fibers are combined which makes it difficult to identify them.

The Natural Fibers

COTTON--These fibers are classed according to their length:

Long staple cotton--fibers are from 1 1/8 to 2 inches long. It is used mostly in making fine cotton fabrics or where great strength is needed.

Short staple cotton--fibers are less than 1 1/8 inches long.

Carded or combed--cotton fibers are carded before spinning. The long staple is combed so that the shorter fibers are taken out, and the long fibers are straightened. Cloth made from combed cotton has smooth, even threads.

Cotton fiber has a natural twist, power to absorb water, and does not lose strength when wet. Cloth made from it is easy to launder and care for. Shrinkage can be controlled, and it takes dye well. It has little elasticity, and crushes and soils easily.

Mercerization is a chemical treatment used on either cotton yarn or cloth. It adds luster, smoothness, strength, and resistance to soiling.

Untreated cotton burns quickly with a yellow flame that flashes along, and is difficult to put out. . The odor is like burning paper, and there is almost no ash left. Mercerized cotton burns a little less quickly than the untreated, and leaves black ash.

WOOL--These fibers vary from 1/2" to 12" in length, and may be fine or coarse. Those used to make clothing are seldom over 3" or 4" long. Wool is warm. The fiber is springy, and cloth made from it does not wrinkle easily. It shrinks and becomes harsh if not washed carefully. The two classes of wool fabrics are woolen and worsted.

Woolen yarn is made by carding its fibers. The yarn is uneven and fuzzy. It is softer and more elastic, but not as strong as worsted. Woolen fabric is not apt to get shiny, but some qualities may get "baggy". Examples: flannel, velour, tweed.

Worsted is made from combed fibers 2 to 5 inches long. The yarns in worsted are tightly twisted, smooth, and hard. The cloth is smooth, strong, resists soil and wear. It holds creases and pleats well, but may become shiny with wear. Examples: serge, gabardine, crepe, men's suitings.

Virgin wool is a trade term often used by manufacturers. It means wool that has never been processed in any way before being completely manufactured into the finished product.

Wool burns slowly with the odor of burning hair. The ash is crisp, and tends to ball up along the edge in an irregular shape. Wool dissolves in strong alkali solution. If fabric made of a mixture of wool and cotton, linen, or rayon is boiled for 15 minutes in a lye solution (one tablespoon lye to pint of water) the wool dissolves and other fibers are left.

SILK--Reeled or long-fiber silk comes from the unbroken cultivated cocoons. It has great length, strength, evenness, and luster.

Spun silk is made from short fibers that come from tangled or broken fibers, imperfect cocoons, wild silk, or from waste left in manufacturing processes. Yarns made from these fibers are irregular and uneven in size, and produces silk fabric that is rough in texture.

Spun silk fabrics have fair wearing quality, dull luster, and may become fuzzy with wear. Examples are shantung and pongee.

Pure-dye silk is silk made only of silk fibers, containing no metallic weighting, and no other foreign substance except that necessary for finishing and dyeing, and that not to exceed 15 per cent for black silk and 10 per cent for white and colors.

The term pure-dye used in this connection has nothing to do with the quality of dye used to color the fabric.

Weighted silk is silk to which metallic salts have been added to give it body and weight. These salts combine permanently with the silk fibers. Weighted silk wrinkles badly, cuts along the seams and stitching lines, and breaks or cracks where there is wear.

Pure-dye silk burns readily with a small blue flame. The ash is black and shiny, and forms in tiny, brittle heads along the edge of the fabric. The odor is like that of burning feathers. Weighted silk chars rather than burns, and leaves a black ash of the same shape as the material. The odor may not be as strong as that of pure-dye silk.

LINEN--There are two kinds of linen fibers:

Line--These are the long fibers of flax measuring 12-36 inches. They are quite regular, and can be twisted and evenly spun into smooth threads. They are used for making the finest quality of linen material, as high grade table damask and handkerchief linen.

Tow--These are the short and broken fibers. They make more coarse, weaker yarns which have less luster than line yarns. They are used for making toweling crashes, novelty lunch clothes, and more coarse dress linens. Fabrics made from tow yarns tend to lint and get fuzzy.

Linen is more stiff and lustrous than cotton. It absorbs water readily and dries quickly.

Linen wrinkles easily, but this is being partly overcome by crush-resistant finishes. It is often difficult to distinguish between cotton and linen without a microscope. They burn much alike. Ravel out a yarn and break it--an all-cotton yarn breaks with a brushy end; and untreated all-linen yarn breaks with a pointed end.

Synthetic Fibers

New fibers and fabrics are given much publicity and glamour while we may hear little of the natural fibers. Yet fabrics made from them are still among the standbys in clothing for the family, and filling the linen closet. Fabrics made from natural fibers haven't given way to the new man-made fibers, but in many cases there has been a blending of the two. It may prove that blending with natural fibers will be the best use of some of the new fibers now in the process of development.

RAYON--Rayon was the first man-made textile fiber. The fibers can be made of any length and thickness, and with a shiny or dull luster. The kinds of rayon and the percentages made in the United States at the present time are:

Viscose (about 66%)
Cuprammonium (Bemberg 2%)
Acetate (about 32%)

The chemical and technical process of making the rayons differ, but all have this in common:

a. The basic material is cellulose, which is reduced to a liquid.
b. The liquid is forced through tiny holes.
c. The liquid streams are changed into solid filaments.

Types of rayon yarn made by any of the three processes may be:

Filament rayon yarn--which is a continuous thread.

Spun rayon yarn--made from staple fiber, which is rayon fiber produced or cut in short uniform lengths, and spun into yarn.

Rayon yarns are also made in different strengths. Viscose and acetate rayon are made in regular, medium, and high strength yarns. Cuprammonium rayon is made in one strength, which corresponds to regular strength viscose rayon or medium strength acetate.

All rayon loses strength when wet, but regains its original strength when dry.

Viscose and cuprammonium rayon burn like cotton. Acetate rayon puckers and curls as it melts into a hard, brittle, rounded form. Chloroform, acetone, or finger nail polish remover containing acetone will dissolve acetate rayon.

NYLON--This fiber may be produced in three forms:

Monofilament--a single solid strand of great strength and smoothness.

Continuous multafilament--a number of tiny, almost endless filaments twisted into one strand, strong, smooth, and very pliable.

Staple--fibers from one to five inches long. This can be spun alone or with other staple fibers. Nylon staple can be crimped to give added springiness.

Nylon fabric is strong and light, resistant to wear, easy to wash, dries quickly, and is moth and mildew resistant. The size and shape may be set by using moist heat. Nylon stockings are thermo-set in shape by steam under pressure. Nylon will not blaze when it comes in contact with flame, but it will melt.

ARALAC--Is the fiber made from milk and resembles wool. So far it has been used mostly in combination with wool or rayon.

GLASS FIBER--Fine fibers are made from molten glass, and are spun into fabrics. It is not practical for clothing, but may be used for home furnishings and industrial uses.

VINYON--This fiber has characteristics similar to nylon, but melts at a very low temperature so is unsatisfactory for any article that needs ironing. Most vinyon fabrics are used industrially as filter cloth, screen-printing cloth, fish nets, twine, and dental floss.

VELON AND SARAN--Also have many of the characteristics of nylon. It was first produced in a coarse, monofilament fiber and used in drapery and upholstery materials, purses, suit cases, shoes, and screening.

Multafilament fiber is being developed so it may serve other purposes in the textile field.

PLEXON--Is a yarn made of cotton or rayon and coated with plastic.

PLASTICS--Plastic fabrics, as commonly spoken of, are of two kinds:

Film plastic or unsupported plastic which is a thin sheet of soft pliable pure plastic. Some types of film plastic are thermo-set, others are thermo-plastic, and soften with heat, but become brittle when cold.

Plastic coated fabric has a cloth backing.

Experimental Fibers And Fabrics

Experiments are being carried on in making fibers and fabrics from the following: Soybeans, peanuts, corn, fish, feathers, seaweed, redwood, yucca.

Metallic yarns are being made from aluminum coated with cellulose acetate. This process gives some strength and elasticity to the aluminum, and a coating which prevents tarnishing and resists soil. Any color may be added.

Asbestos yarns, made into fabric for ironing board covers, or combined with cotton to make lintless toweling, are other fabrics under experiment.

How Fabric Is Made

WOVEN FABRIC--There are three basic weaves by which fibers are woven into cloth:

Plain weave or over and under, is the simplest, and is a durable weave if the yarns are close together and there are the same number in both warp and filling.

Examples: gingham, sheeting, percale.

Twill weave can be identified by diagonal ribs on the fabric. It may tend to stretch more than a plain weave, but is strong and able to resist wear. Denim, gabardine, and serge are common examples.

Satin weave has a smooth, lustrous surface because warp or filling yarns are thrown on the surface. The durability of satin weave depends on the length of the yarn on the surface. If long, they may roughen or catch and snag.

KNIT FABRIC--There are two methods of making knit fabrics:

Circular knit (also called weft or filling knit) a single yarn travels around to form a tubular fabric, or back and forth to form a flat fabric. This kind of knitting may be done by hand or machine. Circular knit fabrics have a two way stretch.

Warp knit - The fabric is made by the diagonal crossing and looping together of warp yarns. The interlocking loops make the fabric run resistant. Warp knitting is a more complicated process than weft knitting, and can be done only by machine.

FELT--Felt is made by matting wool fibers, or wool and hair or other fibers together by means of moisture, heat, and pressure. A loosely woven fabric is sometimes used as the base.

Fabric Finishes

All fabrics, except some used for industrial purposes and unbleached muslins, are put through various finishing processes before they reach the consumer. These finishes are intended to make fabrics better looking and more serviceable. Some have been used since cloth was first made, others are very new.

Finishes may be divided in two groups, standard finishes and special finishes. Some typical standard finishes are bleaching, dyeing, printing, mercerizing, napping, singeing, and shrinking.

Special finishes are used in addition to standard finishes to give some special quality to a piece of cloth, as crease resistance, water repellency, and the like. Most of the special finishes are fairly new, or have been greatly improved the past few years.

Water Repellent Finishes - Fabrics that have a water repellent finish will protect against showers and moisture, and will resist soil and stain. The finishes do not seal the pores of the fabric, which makes garments made from them more comfortable to wear.

Some water repellent finishes are removed or made ineffective by dry cleaning or laundering. Such information should be given on the tag or label.

Some dry cleaners are equipped to add water repellent finishes. There are other such finishes being made for home use.

Waterproof Finishes - Fabrics are made waterproof by coating them with a continuous film of a substance like rubber or synthetic resin. This coating seals the pores of the cloth to water and to free passage of air. Most waterproof finishes resist spots and stains, and may be washed with soap and water.

Glazed Finishes - These finishes may or may not be permanent. Some of the earlier ones were removed by washing. Modern methods use a starchless chemical that causes the glaze to become part of the fabric, and makes it very resistant to laundering.

Shrinkage - Wash fabrics made of cotton linen, and many spun rayons or fabrics combining these fibers can be finished by a mechanical process that will reduce further shrinkage of the material.

Synthetic resins may be used to reduce shrinkage in fabrics that cannot be shrunk by a mechanical process. This method is not entirely satisfactory because the resins may lose their effectiveness after the fabric has been laundered a number of times.

Several processes for shrinking wool and rayon have been developed. Some are applied to articles of clothing as socks, others can be used on piece goods. Lanaset and Resloom are fairly common trade-names.

Crease Resistance - There are many special finishes to reduce wrinkling of fabrics. There is no finish that will make a fabric crease-proof, but a fabric that has a good crease resistant finish will not wrinkle readily, and wrinkles will hang out easily. Tebilized is a common trade name.

Permanent Crispness - Some fabrics, especially sheer ones, are given a crisp finish. If the fabric is described as permanently crisp, the finish should last the life of the fabric.

Moire' Finishes - This finish is not permanent except on acetate rayons. Water or steam will destroy moire' finish on other rayons and on silk.

Flame Resistant - Several methods of treating fabrics with flame retardants have been developed. Fabrics treated with these finishes will char but not burn. These new flame resistant finishes are said to remain effective after repeated laundering or dry cleaning. Fabrics so finished are not yet in wide use, but some are coming on the market in wearing apparel and decorating materials. Labels should give information if such a finish is used.

Borax (7 oz.), with boric acid (3 oz.) in two quarts of water is a home treatment that is effective, but is removed by washing.

Other special finishes are meth and mildew preventatives, gas fading inhibitors (for acetate rayon), and antiseptic finishes to inhibit the growth of bacteria (suggested for shoe linings, mattresses, hospital linens).