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CLOTH AND ITS USES

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CO-OPERATIVE EXTENSION WORK IN AGRICULTURE AND
HOME ECONOMICS, COLORADO AGRICULTURAL COLLEGE
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FOREWORD

In writing this bulletin an effort has been made to select from the large amount of subject matter relating to Clothing and House Furnishing the sort of information needed by the woman or girl in the home, eliminating that portion which depends on laboratory work and requires long hours of book study.

CLOTH

What's In a Name?—Textiles is the name by which this subject has always been known in the field of Home Economics. In this, as in other fields, however, great progress has been made. On account of the growing popularity of knitted materials for use in clothing, and doubtless before long, in house furnishing, it will be seen that the term "Textiles" which means literally "material or fabric woven in a loom," could hardly be used. The words "Fabrics" and "Materials" also have many meanings.

Cloth, meaning "a fabric, woven, knitted or felted from wool, cotton, linen, silk, ramie, jute or other fibers, and which may be made up into garments or for other uses," seems to cover the field better than any other name. Moreover, the plain everyday word "Cloth" does not seem to imply as much detailed study of fibers, chemical tests and processes of weaving as is generally included in the term "Textiles."

PURPOSE OF BULLETIN

The purpose of this bulletin is twofold: To teach, first, *What to Buy* in the way of woven and knitted materials for use in clothing the family and furnishing the home; Second, *How to Use* such materials to best advantage.

It will be easily seen that for the average woman or girl it is not necessary to go back of the "yard goods" for subject matter. This is the "raw material" with which most of us have to deal and indeed there is a vast amount of practical knowledge to be gained from a study of just "yard goods."

CLOTH AND ITS USES

BY BLANCHE E. HYDE

The problem of buying cloth for clothing and house furnishing purposes has changed since the days when our "foremothers" carded and spun the fibers raised on the farm and wove them into cloth. This they made up themselves into garments for the family, or if the supply was more than was likely to be needed by the family, it was sold or exchanged for something not possible to raise on the home farm.

These old-time materials cannot, however, compare with the products of our modern looms. They differ in many ways—in the preparation of the yarn of which the cloth is made, in the effect of the weave itself, in the beautiful, clear color which it receives in the dyeing operations and finally in the exquisite finish imparted to it.

Each and every one of these processes combines to make a beautiful piece of cloth. So it is little wonder that the woman who goes "a-shopping" is fairly bewildered at times by the variety and beauty of the materials put before her.

Certain considerations with which she is vitally concerned enter into her decision. These considerations may be enumerated as: 1. What to buy from a standpoint of cost or economy; 2. What to buy from a standpoint of beauty; 3. What to buy from a standpoint of suitability; 4. What to buy from a standpoint of durability or general utility.

No matter how much we may talk around it, some one, at least, of the above factors enters into the "shopping mind" of most women.

Before considering *What to Buy*, it will be in order to list the uses to which cloth is put in the home; and the qualities looked for in those uses.

Cloth is used in the making of various articles of clothing for persons of all ages, and in almost innumerable ways in the furnishing and operation of the home.

In clothing for infants, children and adults the uses may be classified as for: Undergarments, dresses or outer-garments, outdoor clothing, and accessories. These uses include trimming materials of lace, embroidery, braid, or tape edgings, as they are used on the different types of garment.

In the furnishing and operation of the home, material is used for: Draperies, upholstery, household linens, floor coverings and miscellaneous uses.

DIFFERENCES IN MATERIAL

The qualities necessary for the various uses to which cloth is put are due to certain factors which enter into the construction of all cloth. These factors not only cause one material to appear different from another but impart other qualities to the material, making it valuable for different purposes.

These factors are: Fiber, preparation of yarn, character of weave, color, design, and finish. Each one of these five factors has an immense number of possible variations of which we will consider principally those variations which affect the purchase and use of the materials with which we are most familiar.

FIBER DIFFERENCES

The chief factor in the differing of one material from another is the fiber of which it is made. Of the fibers, four are in much more general use than the others, namely, cotton, flax, wool and silk. These may be said to be the staple or commercial fibers, as from time immemorial they have been in general use.

Another very important fiber to be regarded almost as a staple is known as artificial silk or "fiber silk." This has long since passed the experimental stage when it was feared that on account of its solubility the possibilities for its use would be extremely limited. It has now reached a point where, in certain materials, effects are produced which would be almost impossible to obtain with true silk. The element of difference in cost from that of true silk also enters into its popularity.



Silk and Cotton Ratine—Novelty Yarn

Some of the other fibers which are used commercially are jute, hemp, sisal, ramie and, in some localities, grasses and fibers of other plants or trees.

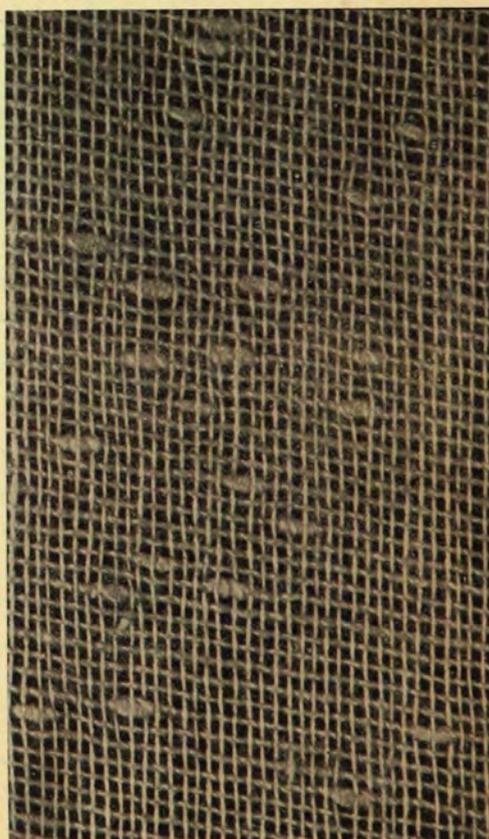
Cotton, flax, jute, hemp, sisal, ramie and practically all of the artificial silks are vegetable fibers, that is, are obtained from plants, either the fiber itself being obtained directly from the plant or, as in the case of artificial silk, produced artificially by a series of operations having as their foundation, certain plant products.

Wool and silk are animal fibers. In the case of wool the fiber is obtained directly from the sheep, while silk comes from the cocoon spun by the silk worm. The cocoons are first softened and then the silk is unwound or reeled off.

The term "spun silk" means silk made from damaged or imperfect cocoons. The silk from these cocoons is not in a long, continuous fiber but in short lengths. This type of silk is treated like cotton or wool fibers, carded and spun, while with the silk unwound from the cocoons it is only necessary to double and twist several fibers together.

In materials made from spun silk the short fuzzy ends are apt to work to the surface as in some materials of cotton or wool.

All fibers have certain characteristics which make them valuable for cloth. The most important of these characteristics are: Length, strength, smoothness, luster, fineness, elasticity, power to absorb dyes, power to absorb moisture, and power to conduct heat. These characteristics are present in greater or less degree in

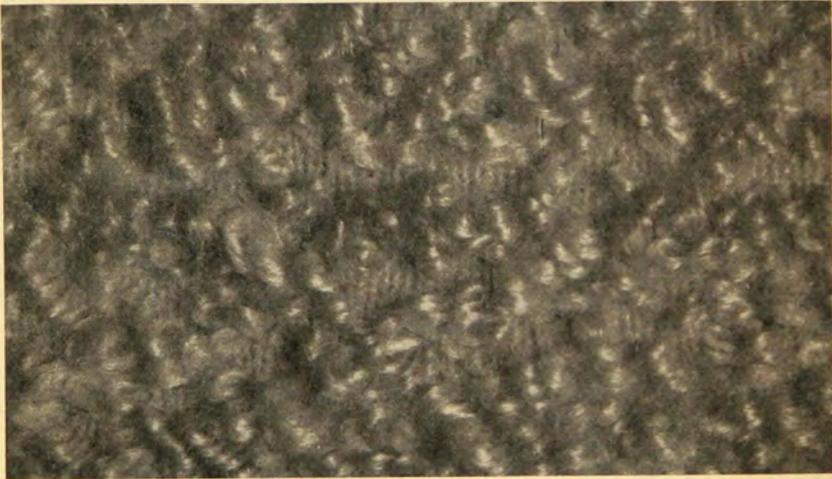


Rice Cloth—Novelty Yarn

each one of the fibers, and manufacturers make use of these natural characteristics when planning cloth for various uses.

YARN DIFFERENCES

The character of the yarn of which cloth is woven has far more to do with the appearance of the woven cloth than one would suppose. The principal ways in which one thread of yarn may differ from another aside from the fiber of which it is made are as follows: *Size*, depending upon the fineness of the fiber and the number of times the thread is doubled upon itself:



Novelty Yarn Used in Knit Coating

Strength, due in large measure to the length and character of the raw fiber: *Evenness*, produced by the character of the fiber, and the care in manufacturing the yarn: *Color*: *Amount* of twist: *Direction* of twist: *Tension* of yarn and *Design* of yarn, as plain or novelty.

WEAVE DIFFERENCES

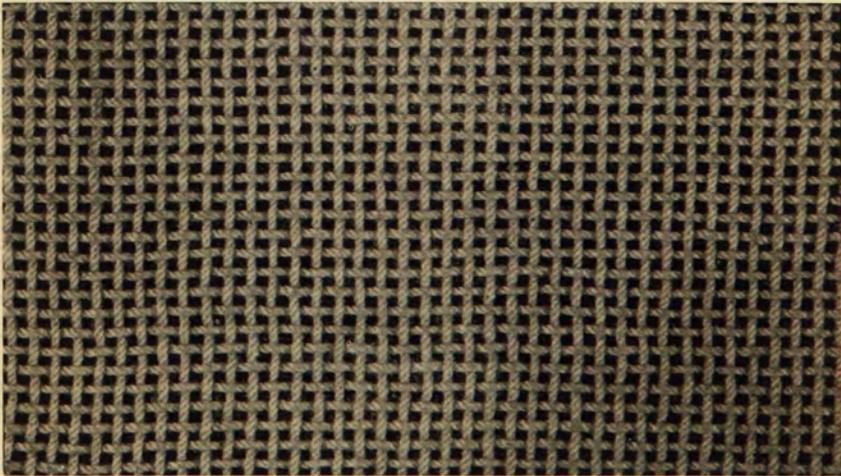
Weaving is done on a loom, the most elementary requirement of which is the providing of a frame on which the foundation threads may be tightly stretched. These foundation threads, which are the lengthwise threads of the material after it is woven, are the warp threads and on account of the strain to which they are subjected, great strength is required of them. The preparation of warp yarns is a highly specialized process, and one in which the better grade of fibers are used. The threads which are at right angles to the warp threads and which inter-



Seersucker—Difference in Tension of Yarn

lace them at regular or irregular intervals, are the woof threads, also called the crosswise or filling threads. The latter term is perhaps the most clearly understood, as, if a closely woven material is desired, the filling threads may literally fill the spaces between the warp threads.

The manner in which the filling threads intersect the warp threads is what gives the different effects known as weave and sometimes as texture.



Plain Weave

The term texture, however, is frequently used in referring to a cloth made of a yarn that is somewhat heavy or uneven.

Plain Weave and Its Variations.—The simplest type of weave, where the warp and filling threads cross alternately is known as the plain weave. Gingham, sheetings, nainsook, some flannels and many other materials are examples of this weave. This plain weave has many possible variations producing different and attractive effects.

These variations may be due to the yarn as already stated or to the grouping, separation, or tension of the threads.

An example of plain-weave material in which the yarn differs in color is a checked or plaid gingham.

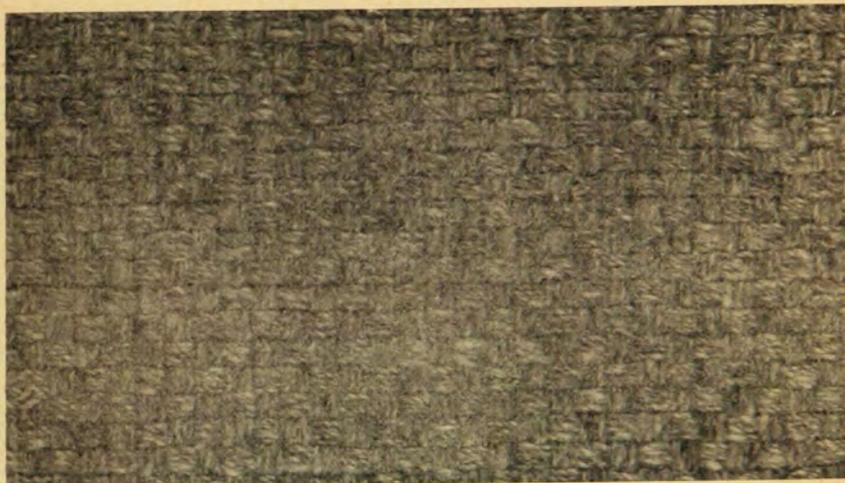
An example of plain-weave material in which the yarn differs in size is poplin or rep. This material has a heavy thread which produces a ribbed effect. Ratine is generally woven in a plain weave with a novelty yarn.

An example of material in which the threads are grouped, and the crossing of the warp and filling threads is over two or more and under the same number, is the basket weave. This weave, especially when done in heavy threads, is very decorative in effect, but as loosely spun yarns are generally used for this type of material, it is not as satisfactory in wear as more closely woven materials.

An example of plain-weave material in which the threads are separated is a canvas, or a voile. An example of plain-weave material in which the threads differ in tension is seersucker.



Poplin or Rep



Basket Weave

Twill Weave.—A twill weave may always be recognized by the diagonal lines extending across the material. In a twill weave the filling threads pass over and under the warp threads in a regular variation.

A variation in the effect of a twill weave is the slant of the twill which is occasioned by the warp threads being finer and closer together than the filling threads, or the filling threads being finer and closer together than the warp threads.

Other variations in the twill weave may be produced by the twist or size of the yarn, or by combinations of other weaves with the twill weave. When the twill weave is large or conspicuous, it is called a diagonal, a whipcord, or a Poiret twill.

Twill weaves are desirable because of the added firmness and strength given by the use of more threads, as twilled materials are much closer in effect. The twill weave often is decorative in itself.

Satin Weave.—There is no doubt but that the effect of the satin weave, especially when woven of the silk fiber, is the most beautiful of any of the weaves.

The satin weave is closely related to the twill, but no diagonal line is visible on the right side, altho many satins show a decided twill on the wrong side.

Satin was formerly distinguished from sateen in that in satins the lengthwise threads formed the smooth surface of the material, while in sateens it was formed by the filling threads. Now, however, the use of all-silk is the deciding factor in

the name. Aside from the various materials made from silk, and known as satins, the same weave is found in wools, under Venetian cloth, a standard material which, however, is not in use at the present time, and in satinette, a silk-and-cotton or all-cotton material used for undergarments.

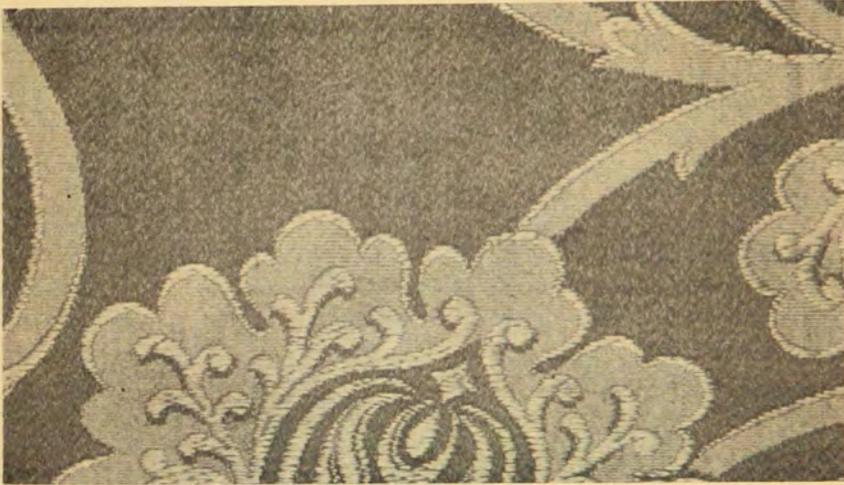
Galatea, a material extensively featured for children's clothing, is a satin weave. The weave adds to its strength, but on account of this very closeness of the weave, dirt is apt to become ground in on the surface, necessitating hard rubbing when being laundered, as water does not penetrate it easily. The hard rubbing often causes the material, if dyed a plain color, to have a faded appearance.

Many coat-lining materials are in the satin weave, and an excellent wearing lining satin is made with a cotton back. This material is apt to be woven with the warp threads carried over so many filling threads, to produce a material of rich luster, that there are not enough intersections to keep the warp threads in place under constant rubbing, or in contact with any roughness. This causes the silk threads or "floats" to catch and loosen, and later, break. A "float" is the length of thread between two intersections of the thread running in the opposite direction.

Figured Weave.—This is a complicated process, done on that formidable and intricate type of loom, the Jacquard. While it is not necessary for us to go into the details of the weaving process, the name Jacquard is something which we should all associate with materials of elaborate weave, as materials are often



Twill Weave



Satin and Figured Weave

advertised as "Jacquard materials" and the name should immediately bring to mind material having an elaborate design of woven figures.

Table damask is a combination of a satin and figured weave, the figure being put in a sateen weave, that is the design in figured table damask is carried out with the filling threads.

Other examples of figured weaves are upholstery materials, novelty goods for clothing, huck toweling and many other materials.

Double Cloth.—This is the term used to designate the weave used whereby two cloths are woven as one. This term does not refer to the double faced materials used in raincoats, where two pieces of materials are glued or cemented together. Instead it refers to cloth in which two webs, or layers, each having its own set of warp and filling threads, are woven together by certain warp or filling threads from one cloth passing into the other web of cloth at intervals. Many coating materials are woven in this way and often require no lining as the wrong side of the cloth presents an attractive appearance. Frequently a double cloth is made for the purpose of warmth, using a backing of less expensive material.

In the double cloths which are reversible, many beautiful effects are produced entirely different on the two sides of the material. Some of the silencer cloths used on dining tables are good examples of double cloths.

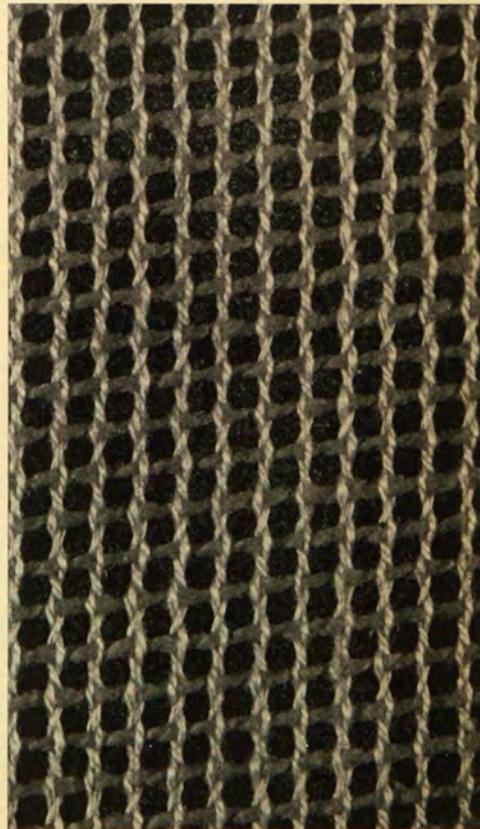
Pile Weave.—Nearly everyone commonly associates two materials with the term pile weave, velvets and carpets. In olden times both of these were classed as luxuries and their use was limited to certain classes of people whose financial condition and social position were supposed to justify such extravagance. At the present time, the use of both of these materials is limited only to those who can pay the price.

Practically each season now, new materials in the pile weave burst upon us, each seemingly more beautiful than the one before. Under this weave come velvets, plushes, corduroys, Turkish towelling, many handsome coatings, all the fur cloths, carpets and rugs.

A pile fabric is one in which the foundation is covered with a soft surface consisting either of a close mass of cut ends or of looped or curled thread. This surface effect may be at right angles to the foundation as in Brussels carpet, velveteen and many of the coatings, or it may be pressed flat to the surface of the foundation, as in panne velvets, and many of the fur cloths.

In all of these materials the foundation is entirely concealed by the surface effect. Many knitted materials are now woven in a pile effect.

Gauze Weave.—This is used in making certain types of materials of a sheer and open texture. If cloth is woven in a plain weave with the threads very far apart, the tendency when laundered would be for the threads to become pushed out of position. In the gauze weave, this difficulty is overcome to a large degree, especial-



Gauze Weave—Marquisette, a drapery material, is a gauze weave

ly if care in laundering is used. A description of the simplest form of gauze weave would be a warp in which the threads are arranged in groups of two, which twist or cross with each passing of the filling thread.

Miscellaneous Weaves.—This term includes combinations of weaves, or effects obtained by attachments used on some of the regular looms. It is not necessary in our study of materials that we go into all the details necessary in analyzing a fabric from a standpoint of weave.

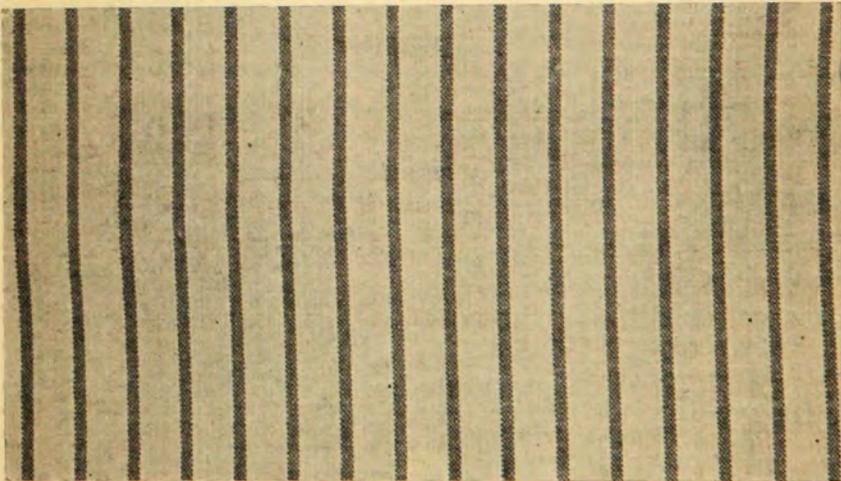
DIFFERENCES DUE TO DESIGN AND COLOR

Materials may be plain, striped, checked, plaid, or figured. The term "plain materials," under this heading, is generally taken to mean plain in color. Materials plain in color may, however, vary considerably according to the character of the yarn and of the weave.

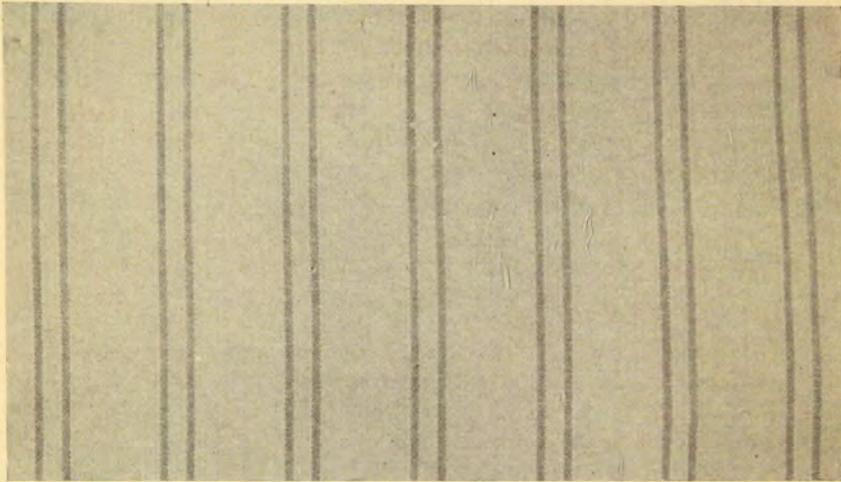
Striped effects may be obtained by weaving or by printing. There are several variations possible in materials with woven stripes. The threads of the stripe may be different from the main body of the material in fiber, color, size, tension, twist, spacing, weave, or a combination of the above differences.

The stripes themselves may vary as to width or grouping in the same material and may be lengthwise or crosswise. Crosswise stripes are not seen frequently. The term "hair-line stripe," is used to mean a striped effect produced by one thread only.

We often refer to striped materials as having an even or



Single Stripe



Double Stripe

regular stripe, that is, stripes of the same width and at regular intervals, or an uneven or irregular stripe, which has a right and left. Stripes woven in a figured design are called novelty stripes.

A *checked material* is one woven in a design in small blocks of alternate colors, not separated by stripes. Very small checks are spoken of as pin checks. When slightly larger and woven of wool in black and white, they are called shepherd checks. The term "shepherd check" has come to include dark browns and blues, in wool, cotton and silk.

Checks an inch or larger are sometimes spoken of as "checker-board" designs, according to the colors or as plaids (black and white plaid, or black and white checker-board plaid.)

Plaid materials or *plaids* are materials in which stripes either singly or in clusters are woven or printed lengthwise and crosswise of the goods crossing each other at right angles, thus forming a design in blocks, either squares, oblongs or both.

Small plaids are often incorrectly spoken of as checks.

The material may be woven in a variety of weaves, or in a combination of weaves. Frequently the main portion of the goods is plain weave, and the stripes, a twill or satin weave.

When the design is printed the material is generally a plain weave, and the plaid may be printed in solid lines or in broken lines to imitate a stripe woven in a twill weave.

According to the arrangement of the stripes which form the plaids, the squares or oblongs may be regular and even on all four sides, or there may be more stripes or a different arrange-

ment or coloring of stripes at the top and bottom of the square or on the sides of the square or oblong. When the arrangement or coloring of stripes at the top and bottom of the square differs, the plaid is said to have an up and down. When the arrangement or coloring of the stripes at the two sides differs it is said to have a right and left.

Figured Effects are obtained by weaving or by printing. The figure may be symmetrical, that is with no up and down or right and left, or it may have both differences.

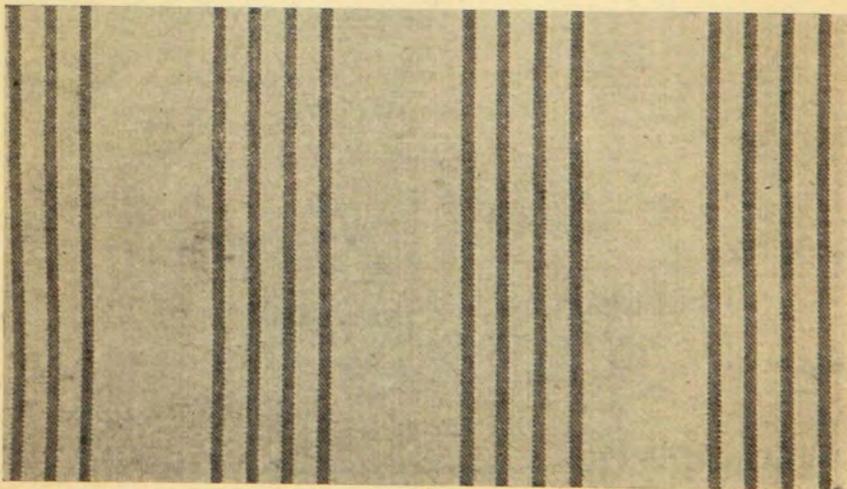
DIFFERENCES DUE TO DYEING AND FINISHING

Dyeing.—When we speak of dyed goods we refer either to one which is dyed a solid color all over or to one in which different colored fibers or yarns have been used in the manufacture of the cloth.

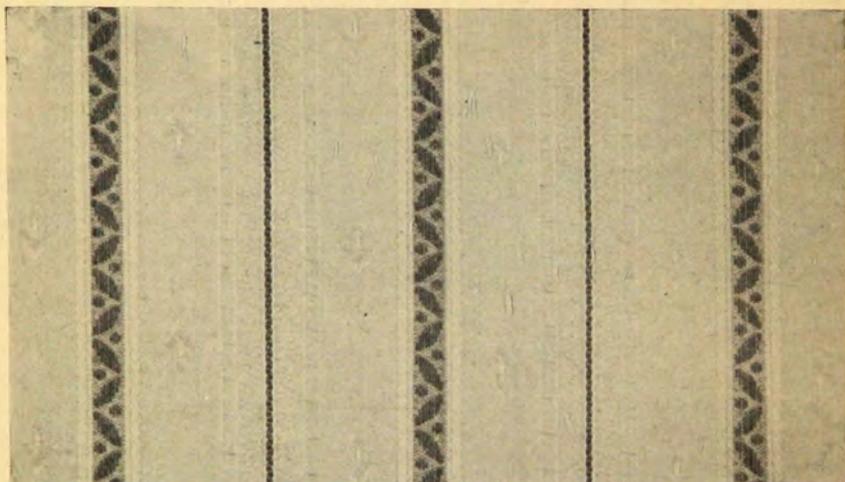
Material may be dyed in the fiber or raw state, in the yarn, or after it is woven in the piece.

Not all fibers are suited to being dyed in the raw state, some are too short, others too long, or too fine. Wool is more apt to be dyed in the raw state than any of the other fibers, and when dyed in this way, the color is firmly fixed in each fiber. The phrase, "dyed in the wool," used to indicate anything unchangeable, doubtless had its origin in this method of dyeing wool.

All of the fibers may be dyed in the yarn, and this is the method employed when a design is to be carried out in a yarn differing in color from other portions of the material.



Grouped Stripes



Novelty Stripe

As a rule yarn-dyed materials are more fast in color than materials dyed in the piece.

Piece-dyeing refers to the dyeing of the woven material. From certain standpoints, it is more satisfactory than fiber- or yarn-dyeing and from other standpoints, not as satisfactory.

Less care in handling of the yarn and material when it is on the loom is necessary if it is in the "gray" or undyed state than if it is dyed, for if the cloth is badly soiled during weaving, it is sometimes necessary to give it strenuous treatment and use strong cleansing agents to remove the soil. These are apt to injure the color, but if the material is in the "gray" it can be thoroughly cleansed and the color applied afterward.

The difficulty of piece-dyed materials is that sometimes it is difficult to get an even color on the material, and in closely woven materials, the color does not always penetrate.

Frequently when one tries to remove a spot from a plain-colored material, after drying, the material which has been rubbed appears lighter in color. This is almost certain to be an indication that the material is piece-dyed.

Printing.—This process is closely allied to dyeing. It refers to the method of applying color to the right side of the woven cloth. This may be done in two ways: Printing the material a solid color, and printing figures or an all-over design on the material.

When material is printed a solid color all over, it is difficult to tell the difference between this and piece-dyed goods.

The printing of designs on the woven material is done by passing the cloth over rollers of engraved copper. If several colors are to be employed, there is a separate roller for each color, each roller engraved according to the color to be used with that portion of the design.

This is so carefully worked out that each color fits its own portion of the design.

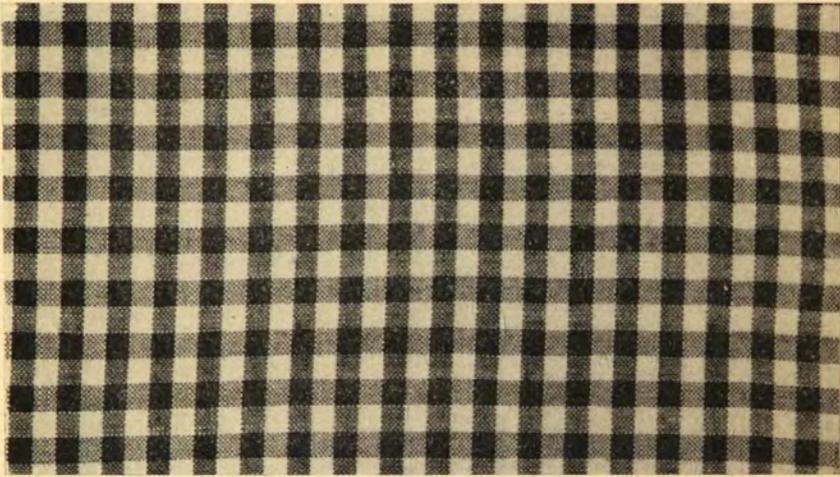
Finishing.—This refers to all the processes through which the material goes after being woven. Finishing affects the material in its appearance, feel, strength, warmth or power of retaining heat, power of resisting moisture, and power of burning.

The processes necessary to accomplish these results vary considerably with the different fibers. These processes, which affect the appearance of the material, are first those which have to do with the imperfections of the weave and consist of removing knots and foreign matter and repairing broken threads. The next step is a thorough cleansing, which also draws the threads of the cloth closer together. In woolen materials, this is called "fulling" or "felting" and is aided by the character of the wool fiber itself. In cotton materials the cleansing process generally includes bleaching.

These cleansing processes are somewhat similar with all the fibers, their object being to cleanse and, in addition, to draw the weave together, and in some cases to practically conceal it. The result is really a shrinking of the goods for while the pro-



Pin Check



Shepherd Check

cess makes the material thicker and apparently heavier, it reduces it in length and width.

When the material is to have a napped surface, like broadcloth, it is felted or fulled very much in order that after the napping there will be no evidence of weave on the right side.

In the case of cotton materials rather cheap in construction which do not respond to the shrinking as readily as wool, the cloth is made to appear thicker, by adding sizing or dressing to give it extra weight and the appearance of a more closely woven material. Starches and China clay are generally used for this and the same treatment is given to linen materials of poor quality. These dressings often give a slight amount of warmth to loosely woven materials.

Silk materials receive chemical treatment which adds to their thickness, weight, and occasionally to their wearing qualities.

One hears a great deal about the weighting of silk. Weighting of silk is not, however, a finishing process. A certain amount of weighting is legitimate and necessary. The cost of pure, unweighted silks would be beyond the purse of most of us. Such material would not give satisfactory wear. Neither is over-weighting always the cause of silk gowns wearing out quickly, therefore no untrained person should attempt to make statements as to the cause of silk splitting or otherwise going to pieces.

The napping process which consists in pulling the ends of the fiber to the surface not only improves the appearance of

the cloth, but its feel as well, and conceals the threads of the weave. According to whether the pile is raised or pressed flat, this process softens the color, or gives it an attractive luster.

Napping adds to the warmth of both wool and cotton materials.

A material which is to have a raised nap needs to be very strong, else the threads of the weave are apt to become weakened in the process.

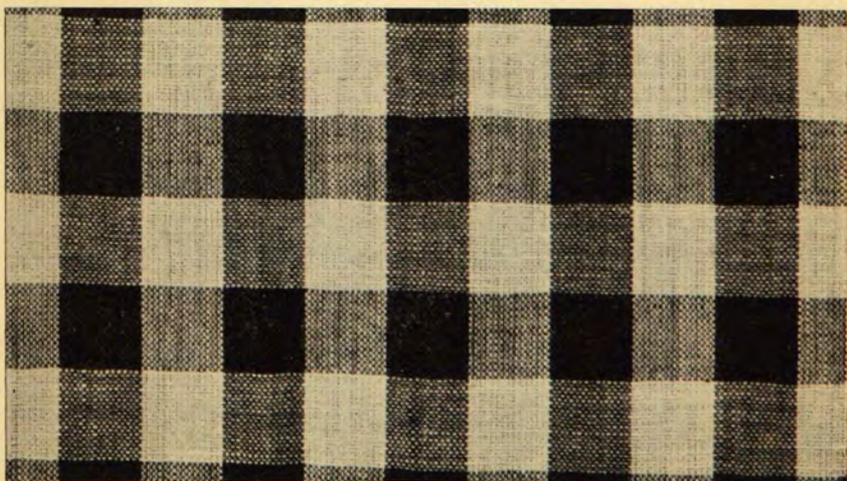
Woolen materials lend themselves best to napping and linen last. Material woven of loosely spun cotton yarns can be napped quite satisfactorily. Canton flannel is an example of this.

The lustering process brings out the natural luster due to the fiber, the preparation of yarn or character of the weave, or if such luster is not present it produces it. It is accomplished by steaming and pressing or by using chemicals or both.

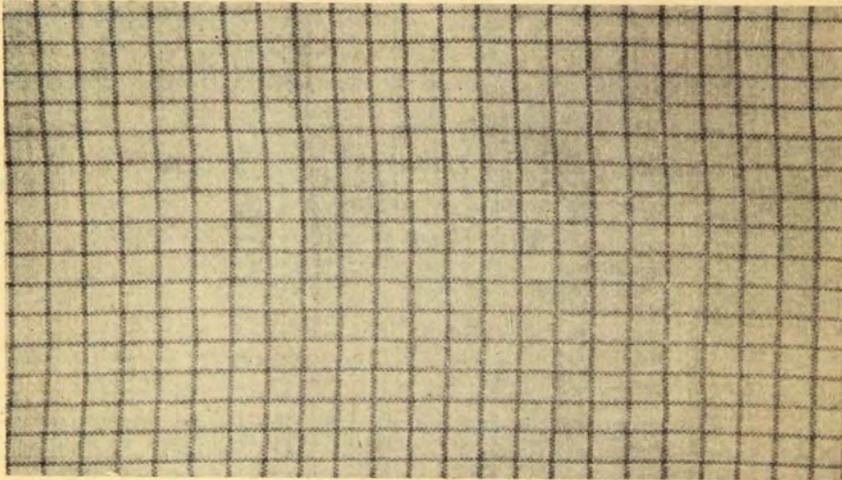
A very lustrous effect is given to cotton by a process known as the Schreiner finish. This is accomplished by means of engraved rollers passed over the cloth with considerable pressure.

Calendaring is a process of pressing or ironing used on cotton, linen and silk, and accomplished by passing the woven cloth between the cylinders of a machine known as the calendaring machine. The amount of luster is controlled by the pressure of the rollers. Glazed, moire and embossed finishes are given to material by this machine.

The mercerizing process not only improves the appearance of cotton material, but it changes the character of the fiber as



Large Check



Lined Check

well, straightening and strengthening it. The straightening of the fiber results in a greater reflection of light, which helps to give the effect of luster to the material. Mercerization is not affected by laundering.

Various other finishing processes give stiffness, softness or pliability to the material, according to the demands of the season.

Materials may be made stronger by the finishing processes to which they are subjected. The sizings and dressings given the material serve as a protection to the yarn against undue wear or strain.

The fulling process, especially in woolen materials, has a decided effect upon the warmth of the material. During this process woolen materials sometimes receive a coating or backing of short fibers. The character of the wool fiber itself, plus the heat and moisture of the fulling process, causes these short fibers, which either are short ends of new wool, sheared from napped materials, or made from waste woolen materials, to adhere to the foundation of the cloth.

The quality of resisting moisture may be given to materials to a certain degree by different dressings, but many of these dressings disappear after washing. Permanent-finish organdy is a material which retains its crispness after washing.

Many dressings have as their object to prevent the material from spotting by water. Another type of dressing has to do with making the material impervious to moisture. This is known

as waterproofing, and may be accomplished in several different ways.

KNITTED MATERIALS

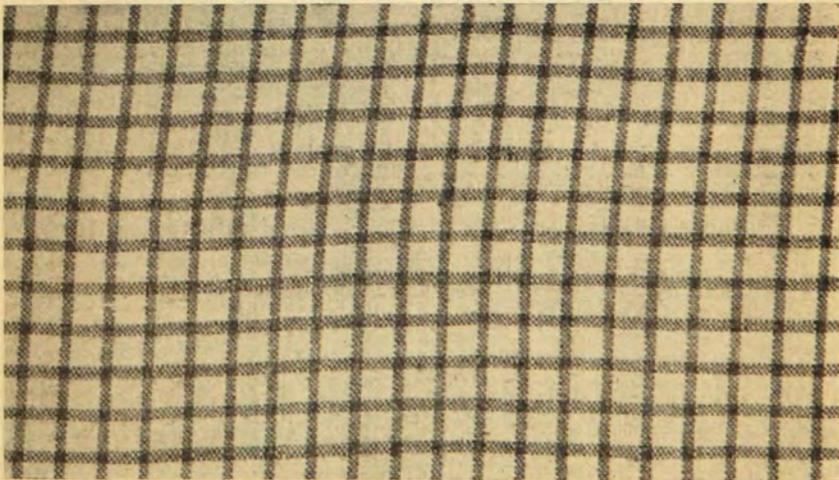
It is not many years since we first looked with surprise upon knitted materials shown as yard goods to be used for purposes other than hosiery, underwear, and neckties.

How do you like it? How does it wear? These were the questions asked of the people who were brave enough to purchase gowns or suits of knitted or Jersey material. The name "Jersey" was given these materials at first from the similarity of the material to the knitted vests or jackets formerly worn by fishermen on the island Jersey, off the coast of Great Britain. Within the last few years knitted materials for dress goods have come to occupy a place of their own with no apologies to any of the woven materials.

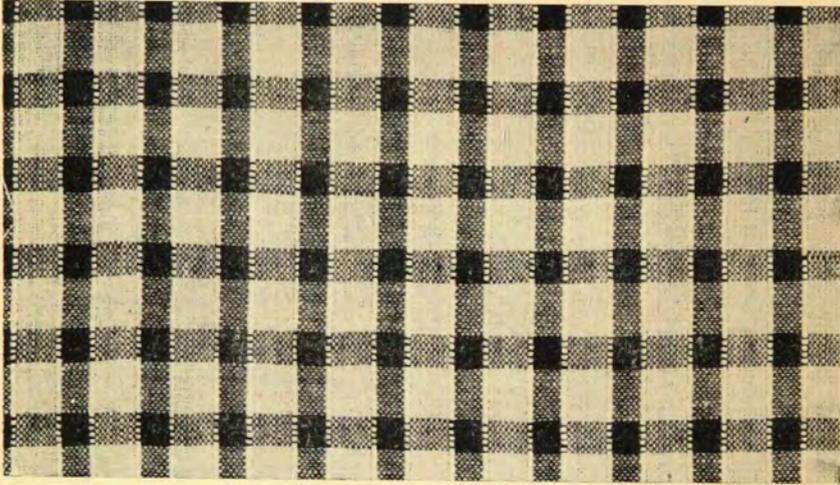
Knitted materials have the advantage of being elastic, pliable and easy to fit, as the meshes of the material can be crowded together or stretched apart.

The objection to the use of knitted materials is due to the fact that on account of the elasticity of the weave, frequently gowns or suits are made up without enough fullness in the skirt, and although the material fits the figure about the hips, the weave draws together below the hips giving a "cupped" effect to the skirt, and an ugly appearance to the entire garment. This can be obviated by allowing sufficient fullness.

Knitted materials of wool, due to the softly spun yarn, are



Heavy-lined Check



Checked or Small-plaid Material

apt to catch dust and lint, and do not brush off as easily as woven materials.

COLOR IN CLOTH

Color in woven materials is very different from a flat tone of color on smooth paper. It is influenced by the fiber, yarn, weave, and design of the material or by other materials combined with it.

These various factors and their effect in the woven material have already been discussed. A red satin will seem much more brilliant in color than red wool in a twill weave or red cotton in a plain weave because of the greater natural luster of the silk and because of the satin weave of the silk, which gives a much smoother effect than the twilled weave of the wool or the plain weave of the cotton. The character of the individual fibers also affects the luster and color greatly.

COMBINATIONS OF MATERIALS

The factors which make two materials look well when combined, and two others form a combination that is not pleasing are sometimes hard to define.

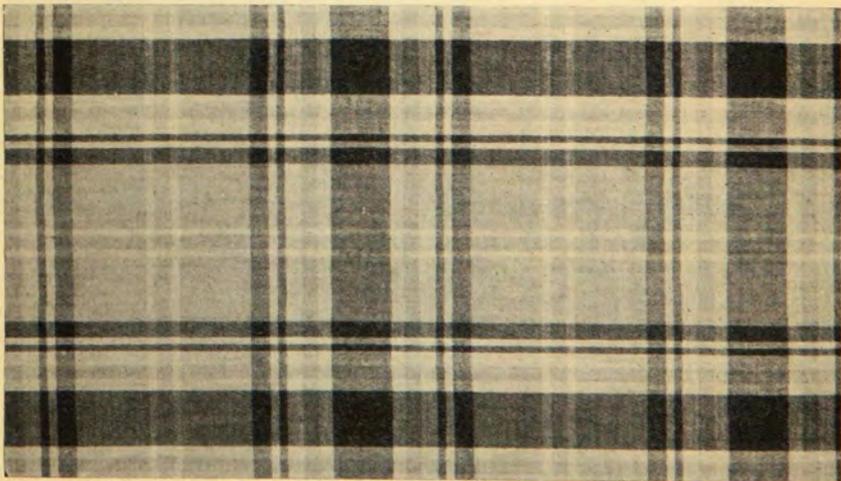
While color is a very important element, frequently two pieces of material which by all the laws of color harmony should combine well, jar in some unexplainable way. An exaggerated example would be the combination of navy blue satin with trimmings of ecru gingham or chambray. While such a color combination would be satisfactory the great difference in expense

of the two fibers would overbalance the pleasing combination of color. Silk being a fabric associated with luxury and cotton with more prosaic details, a combination of the two from this standpoint seems hardly justifiable. While there would be a contrast in weave, the yarn in both materials would be fine and even, giving a comparatively flat effect to both materials. This flat effect would hardly be offset by the difference in the luster of the two materials.

A plain-colored blue gingham combined with a plaid gingham having for its background or foundation a blue to match the plain material, forms a satisfactory combination. There is no discrepancy in the expense of the materials as the fibers and weaves are the same. There is a pleasing contrast in the design of the plaid material, yet enough similarity in the coloring to provide a reason for combination. The materials will launder equally well, and are equally durable.

To sum up, the following factors should be considered when combining materials: Color, style or usage, fiber, weave, luster, seasonableness, quality, pliability, general suitability, expense, laundering, durability and design.

No definite rules can be laid down as to whether the combination should be based on similarity of some of the above factors, or on decided contrasts. Style or fashion has much to do with the combinations of materials, but any girl or woman, if she once learns to consider the matter according to the points out-



An Even Plaid

lined above, will soon be able to decide what and why certain combinations are pleasing and others not.

SUGGESTIONS AS TO USE OF CLOTH

The size and strength of the two sets of threads influence greatly the use of material and the method of cutting it into garments. A garment will generally hang better if the warp or lengthwise threads go up and down, and in some materials, will keep its shape better.

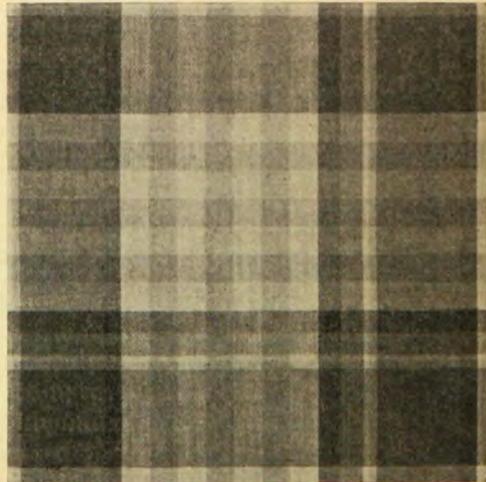
If the material has a heavy crosswise rib and if the pattern of the garment calls for fullness hanging from gathers, the effect will often be better if the garment is planned with the heavy or crosswise threads going up and down.

Material is considered more likely to stretch in its width than in its length, hence belts and bands where strength is necessary are cut lengthwise of the goods.

In cutting and fitting garments the "grain of the material" or the "way of the material" are phrases often used to describe the effect of the weave or the crossing of the warp and filling threads. This is extremely important in the "hang," "fit" and general appearance of the garment. No definite rule can be given regarding this, for style and fashion play havoc with all rules and ideas as to what is correct in clothing and in methods of construction. Experience and a trained eye, with due regard for style features, will prove the best bulwark.

Right and Wrong Sides of Material.—The right side of material is determined by the weave, design or finish. Some materials, especially those of plain weave, if well made and finished, have almost no difference in the right and wrong sides.

To determine which side has been finished for the right side, place the material flat over the palm of the hand and hold it up to the light. If a short nap or fuzz shows on one side more



Plaid with Up-and-down, and Right-and-left Effect

than the other, the smoother side is generally taken as the right side.

In twilled materials like serges, there is a decided right and wrong. When holding the material up against one the twill should slant from the left shoulder diagonally. When looking at the material, the twill should slant from the upper right corner to the lower left.

In satins, in materials having a woven or embroidered figure, or stripes or plaid effects woven in a weave differing from that of the foundation, the difference between the right and wrong sides are very apparent.

In table linens where the novice is sometimes in doubt as to the right and wrong sides, the textile expert will be able to recognize the difference by the way the warp and woof threads go in the design. In table damask the pattern is formed on the right side by the filling threads, which, in the better grades of damask, are of a choicer quality of the flax fiber, hence they reflect the light more and give a much richer appearance to the pattern.

In materials on which the design is printed or stamped, the right and wrong side is apparent as on one side the coloring will be stronger and the outline more distinct.

In some materials the finish determines the right side. This is true of napped materials of which broadcloths are a good example.

Sometimes the method of folding the material determines the right and wrong side. When the selvages are placed together and a crease is pressed in the material through the center, and then the entire bolt of material is wound on a board or rolled, the inside is generally used as the right side.

Materials in which the right side is due to a special kind of finish, are generally folded with the right side inside, so the finish will not be marred by handling.

Materials of delicate color are also folded with the right side inside. This, however, does not prevent dirt from rubbing or showing through, especially on the fold. This can be avoided by keeping the bolts wrapped in white cloth and stored in boxes or drawers. In purchasing light-colored materials it is wise to see whether they are in a satisfactory condition on the right side.

Table damask and some others are an exception to the method of folding goods with the right side inside. Table damask is always folded with the right side on the outside.

Use of Figured Materials.—In using material in which the design is either a woven or a printed figure, the following points

regarding the figures should be considered: Size, spacing, shape, either up and down or right and left, and type, either natural or conventional. These points also influence the choice of the pattern and trimmings.

Use of Striped Materials.—In using striped material, the points to be considered regarding the stripes are their size, spacing, evenness or regularity, right and left, and up and down (in crosswise stripes and in stripes consisting of woven figures).

In closely woven materials, stripes have the appearance of service and utility and call for a pattern suited to that type. In thin, open-weave materials, more latitude may be allowed in the selection of patterns.

In using a striped material, especially stripes which are at all conspicuous in size, color or design, care should be taken that corresponding stripes occupy corresponding positions on the figure.

The popular idea that materials of striped design reduce the appearance of size of a stout person does not hold true when a wide stripe or one conspicuous in coloring is used. Instead stripes of this kind call attention to the size instead of apparently reducing it.

In slanting seams as in the gores of a skirt, the stripes should meet at a good angle and one which looks well on the figure. Moreover, in fitting or hanging a skirt of striped material, care must be taken that the stripes go into the belt at a good angle, else the skirt will have the appearance of "hanging forward" or "hanging backward."

Use of Plaid Materials.—In using plaid materials the design or plaids must be exactly matched at all piecings and straight seams. In slanting seams in a waist or in the gores of a skirt, the crosswise stripes should meet, and the lengthwise stripes should also meet at a good angle.

Plaid materials which are prominent in color or arrangement of stripes should have corresponding plaids or blocks occupy corresponding positions on the two sides of the figure.

Many plaids in addition to an up down in the design also have a right and left, as shown in the illustration. When in addition a right and wrong side of the material is involved, considerable skill in planning the garment is necessary.

There is apt to be more or less waste in matching the plaids, especially in a plaid at all conspicuous in design, therefore allowance should be made when purchasing plaid materials for possible necessary waste in cutting and matching.

It is much more satisfactory to use plaid materials in garments where the seams are straight or nearly so, as less work is required in getting a good effect at the seams than if the garment is shaped or gored.

Use of Plaid Materials in a Straight-Pleated or Gathered Skirt.—In cutting breadths of plaid material for a straight-pleated skirt, consider whether the plaid has an up and down. Choose the portion of the plaid with deeper or darker coloring or a closer arrangement or a greater number of crosswise stripes for the lower edge of the skirt; then plan a hem of such a width that it can be hemmed by hand or stitched by machine at a part of the plaid where the line of sewing will not be conspicuous. Having made allowance for the hem, measure up from the line decided upon for the lower edge, the length desired, plus the seam allowance at the waist, and cut one breadth. It may be necessary in cutting this first breadth to waste a piece of material at the end of the goods in order to obtain the desired plaid for the lower edge. Cut as many breadths as required, using the first breadth as a guide, matching the plaids exactly at the seams.

If the skirt is to be pleated and the right and left of the design will interfere with the effect of the pleats on the two sides of the figure, make a box pleat in the center front, and cut the goods under the pleat, reversing the next breadth, and planning the seam so the desired effect on the pleating will be obtained.

Various color and design effects may be obtained by pleating plaid material for skirts, according to the method of laying the pleats.

Use of Plaid Materials in a Gored Skirt.—In cutting a gored skirt, the effect of the plaids or crosswise stripes should be considered first at the hip line, which is the most prominent part of the figure below the waist.

A gored skirt in which the lower edge is curved is apt to present a very ugly appearance when made of plaid material. Hence, it is wise to consider the pattern carefully when plaid material is to be used.

Use of Plaid Materials in One-Piece Dresses and Waists.—In using plaid material for a dress, care must be taken that the same portion of the lengthwise design is used for the center-front and center-back of waist and skirt. The effect should be considered first at about the bust line, the most prominent part of the figure above the waist. The crosswise stripes of the plaid will then meet high up under the arm, at the under-arm seam.

The material above this part is often concealed by a large collar, and below by falling into lines of fullness at the waist or by a belt or sash. As a rule it is better not to attempt a dress cut entirely in one piece of a conspicuous plaid material.

Wearing of Plaids.—Plaid materials, especially if conspicuous in size, coloring or arrangement should never be worn by large or stout people.

Plaids are suited for children's dresses, for young girls' wear, for sports wear for anyone, and in many cases for trimming.

Plaids should be worn by themselves or with plain materials, and not with other plaids, stripes or mixed effects.

Use of Napped Materials.—Materials which have a decided up and down caused by a napped finish require special treatment.

If the nap is long the material being brushed with the nap to obtain a satiny effect should be cut with the nap running down. If the nap is short the object of brushing is often to raise the nap and give the effect of soft luster. In such a case the cloth should be cut with the nap running up. Velvets with short pile are generally cut with the nap running up.

Allowance for Shrinkage.—Some wash materials shrink or draw up in either width or length during the process of laundering. The amount of shrinkage depends considerably on the weave, as generally materials loosely woven shrink more than those which are woven closely. It also depends on the chemical solutions to which the material has been subjected in the finishing processes at the mill.

Materials do not shrink as much now as formerly as the various finishing processes practically accomplish shrinking also.

Where it is expected that wash material will shrink, it is better to allow a little extra in cutting the garment than to wet the goods before it is made up. This "wetting out" not only takes away the new look, but the material is more difficult to cut, as it is hard to press several yards of new goods in one piece so it will be perfectly straight. Moreover, after material is washed, it soils much more quickly than when new, and it is often possible to wear new materials some time without laundering.

At the present time, most woolen materials are shrunken or sponged before they are sold. This is done by steam much more satisfactorily than would be possible by any home methods.