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A.O. Halgrim

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DEPARTMENT OF HOME ECONOMICS
AGRICULTURAL EXPERIMENT STATION
South Dakota State College of Agriculture
and Mechanic Arts
BROOKINGS, S. D.

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**Anna O. Halgrim**

Style is a large factor in the price paid for women's coats. Just what percentage of the cost of the garment goes to pay for style and what percentage pays for quality of fabric and workmanship is difficult to determine. The time that the purchase is made also affects the cost. Buying at the height of the season increases the price, particularly of style garments. Utility garments are not affected to such a great degree. Exclusiveness of design also affects the price. An attempt is here made to determine how the fabric varies with the differences in price, and whether there is a constant variance.

The garments were bought from typical retail stores in various parts of the state. The cities where the purchases were made are: Aberdeen, Brookings, Deadwood, Huron, Madison, Mitchell, Rapid City, Redfield, Sioux Falls, Vermillion and Watertown. In buying the garments, the purchaser endeavored to find the nature of the guarantee, if any, as well as the sales person's statement concerning the quality of the coat.

Sixty-six garments have been studied. It was attempted to choose coats without fur collars, since so much of the value of the garment might be involved in the fur, and this is not a problem in fur. In most cases this limited the choice of garments to between season coats. Table 1 gives the number of each coat, the price paid, date purchased, type of garment, guarantee if any and sales person's statement as to character of the fibre.

According to the sales person's statement, all the coats but one are all wool. In the case of number 23, the clerk stated that it was more than half wool. The chemical anaylsis showed that approximately 7.04 per cent is wool and 85.55 per cent cotton. The remainder is moisture, filler and dye. While 7.04 per cent is far from half, the coat did have somewhat the texture of wool. Of the others, 15, 42, 51, 57, 58 and 61 are the only ones that contain more than 10 per cent cotton. Six showed more than 1 per cent cotton, ten showed a trace of cotton, while 43 showed no cotton at all.

In making the study, two main factors were considered: first, the fabric analysis, and second, the durability of fabric. Under fabric analysis the study was made in the following order: 1. Weight per square yard; 2. Weave; 3. Number of picks and ends; 4. Yarn count; 5. Yarn twist; 6. Length of staple; 7. Microscopic study; 8. Chemical analysis. The durability of the fabrics was studied under: 1. Tensile strength for woven and bursting strength for knit fabrics; 2. Weathering; 3. Abrasion and tensile strength; 4. Abrasion under Kertez method; 5. Water proofing; 6. Fastness of color; 7. Shrinkage.

The weight per square yard was found according to E. A. Posselt[1] in "Fabric Analysis," page 2. A piece was cut 1/100 of a square yard and weighed to 1/10 mm and from this the weight per square yard was found. In Table 2 the weight per square yard is given in grams and in ounces.

[1]Posselt, E. A., "Fabric Analysis," Philadelphia, Textile Publishing Company.

**Table 1**

NUMBER AND DESCRIPTION OF GARMENT

| | | | | Statement As To Quality | | |
|---|---|---|---|---|---|---|
| No. Gar. | Price | Date Purchased | Type of Garment | Guarantee | Fibre | Lining Fibre |
| 1 | $23.95 | Apr. 17, '26 | Utility Coat | | All Wool | Silk |
| 2 | 9.90 | Apr. 17, '26 | Tweed Utility | | All Wool | Cotton |
| 3 | 35.00 | Apr. 22, '26 | Twill Utility | | All Wool | Silk |
| 4 | 23.75 | | Tweed Utility | | All Wool | Silk |
| 5 | 19.75 | Apr. 30, '26 | Twill Utility | | All Wool | Silk |
| 6 | 14.95 | May 13, '26 | Tweed Utility | | All Wool | Cotton |
| 7 | 45.00 | | Tweed Utility | | All Wool | Silk |
| 8 | 29.50 | | Tweed Utility | | All Wool | Silk |
| 9 | 24.50 | | Twill Utility | | All Wool | Silk |
| 10 | 16.75 | May 15, '26 | Twill Utility | | All Wool | Silk |
| 11 | 20.00 | | Tweed Utility | | All Wool | Cotton |
| 12 | 34.75 | Apr. 12, '27 | Tweed Utility | | All Wool | Cotton |
| 13 | 24.50 | | Tweed Utility | | All Wool | Silk |
| 14 | 37.50 | | Pile Coat | | All Wool | Silk |
| 15 | 25.00 | | Utility | | All Wool | Silk |
| 16 | 35.00 | Apr. 27, '27 | Tweed Utility | | All Wool | Silk |
| 17 | 18.75 | | Tweed Utility | | All Wool | Silk |
| 18 | 39.50 | | Tweed Utility | | All Wool | Silk |
| 19 | 69.50 | Apr. 28, '27 | Utility Coat | | All Wool | Silk |
| 20 | 14.75 | | Utility Coat | | All Wool | Silk |
| 21 | 39.75 | | Utility Coat | 100% Virgin Wool | All Wool | Silk |
| 22 | 17.00 | May 24, '27 | Utility Coat | | All Wool | Silk |
| 23 | 10.00 | | Utility Shepherd Check | | ½ Plus | Part Silk |
| 24 | 29.75 | | Utility | | All Wool | Silk |
| 25 | 24.75 | Mar. 28, '28 | Tweed Utility | | All Wool | Silk |
| 26 | 29.75 | | Tweed Utility | | All Wool | Silk |
| 27 | 59.50 | | Repeau Utility | | All Wool | Silk |
| 28 | 15.00 | | Twill Utility | | All Wool | Rayon |
| 29 | 19.75 | | Twill Utility | | All Wool | Silk |
| 30 | 24.95 | Mar. 30, '28 | Twill Utility | Lining 2 Yrs. | All Wool | Silk |
| 31 | 49.50 | Apr. 2, '28 | Twill Utility | Lining 2 Yrs. | All Wool | Silk |
| 32 | 29.75 | Mar. 27, '28 | Knit Utility | 100% Virgin Wool | All Wool | Silk |
| 33 | 49.75 | Apr. 18, '28 | Knit Utility | | All Wool | Silk |
| 34 | 25.30 | Apr. 23, '28 | Tweed Utility | | All Wool | Silk |
| 35 | 19.75 | Apr. 27, '28 | Tweed Utility | | All Wool | Silk |
| 36 | 50.52 | Apr. 27, '28 | Twill Utility | | All Wool | Silk |
| 37 | 25.00 | Sept. 27, '28 | Tweed Utility | | All Wool | Silk |
| 38 | 19.75 | | Tweed Utility | | All Wool | Silk |
| 39 | 49.50 | | Utility Coat | | All Wool | Silk |
| 40 | 35.00 | Oct. 11, '28 | Tweed Utility | | All Wool | Silk |
| 41 | 29.50 | | Tweed Utility | | All Wool | Silk |
| 42 | 45.00 | Oct. 12, '28 | Tweed Utility | | All Wool | Silk |
| 43 | 29.75 | | Tweed Utility | | All Wool | Silk |
| 44 | 16.75 | | Tweed Utility | | All Wool | Silk |
| 45 | 19.75 | | Tweed Utility | Shower Proof | All Wool | Silk |
| 46 | 39.75 | Oct. 13, '28 | Tweed Utility | | All Wool | Silk |
| 47 | 24.00 | | Tweed Utility | | All Wool | Silk |
| 48 | 14.00 | | Tweed Utility | | All Wool | Silk |
| 49 | 29.50 | | Tweed Utility | | All Wool | Silk |
| 50 | 16.75 | Oct. 15, '28 | Tweed Utility | | All Wool | Cotton |
| 51 | 36.95 | Oct. 7, '29 | Tweed Utility | | All Wool | Silk |
| 52 | 19.75 | Oct. 7, '29 | Tweed Utility | | All Wool | Silk |
| 53 | 69.50 | | Sport | Camel's Hair | Camel's Hair | Silk |
| 54 | 49.50 | | Tweed Utility | | All Wool | Silk |
| 55 | 24.75 | Oct. 9, '29 | Tweed Utility | | All Wool | Silk |
| 56 | 27.50 | | Tweed Utility | | All Wool | Silk |
| 57 | 19.75 | | Tweed Utility | | All Wool | Silk |
| 58 | 49.50 | | Tweed Utility | | All Wool | Silk |
| 59 | 14.75 | | Tweed Utility | | All Wool | Silk |
| 60 | 24.75 | Oct. 10, '29 | Sport | | All Wool | Silk |
| 61 | 35.00 | | Sport | | All Wool | Silk |
| 62 | 15.00 | | Tweed Utility | | All Wool | Silk |
| 63 | 49.50 | Oct. 11, '29 | Tweed Utility | | All Wool | Silk |
| 64 | 29.85 | | Tweed Utility | | All Wool | Silk |
| 65 | 16.75 | Oct. 12, '29 | Tweed Utility | | All Wool | Rayon |
| 66 | 14.75 | | Tweed Utility | | All Wool | Silk |

**Table 2**

WEIGHT PER SQUARE YARD IN BOTH GRAMS AND OUNCES

| Coat | In Grams | In Ounces | Coat | In Grams | In Ounces |
|---|---|---|---|---|---|
| 1 | 270 | 9.53 | 34 | 560.72 | 19.79 |
| 2 | 204.75 | 7.22 | 35 | 203.32 | 7.17 |
| 3 | 204.75 | 7.22 | 36 | 185.92 | 6.56 |
| 4 | 251.1 | 8.86 | 37 | 401.088 | 14.158 |
| 5 | 189.9 | 6.70 | 38 | 233.74 | 8.25 |
| 6 | 328.5 | 11.59 | 39 | 351.07 | 12.39 |
| 7 | 366 | 12.91 | 40 | 355.955 | 12.565 |
| 8 | 322.2 | 11.37 | 41 | 328.968 | 11.61 |
| 9 | 288 | 10.16 | 42 | 354.429 | 12.51 |
| 10 | 472.5 | 16.67 | 43 | 590.528 | 20.84 |
| 11 | 227.7 | 8.03 | 44 | 502.442 | 17.736 |
| 12 | 572.49 | 20.20 | 45 | 500.963 | 17.68 |
| 13 | 327.24 | 11.35 | 46 | 546.134 | 19.278 |
| 14 | 378.9 | 13.37 | 47 | 287.74 | 10.157 |
| 15 | 394.92 | 13.94 | 48 | 335.145 | 11.83 |
| 16 | 237.24 | 8.37 | 49 | 281.093 | 9.92 |
| 17 | 285.2 | 10.06 | 50 | 313.462 | 11.08 |
| 18 | 282.6 | 9.97 | 51 | 395.59 | 13.96 |
| 19 | 233.82 | 8.25 | 52 | 369.93 | 13.05 |
| 20 | 297.27 | 10.49 | 53 | 369.93 | 13.05 |
| 21 | 329.58 | 11.63 | 54 | 331.50 | 10.70 |
| 22 | 254.34 | 8.97 | 55 | 224.08 | 7.90 |
| 23 | 109.71 | 3.87 | 56 | 156.50 | 5.52 |
| 24 | 275.4 | 9.72 | 57 | 370.56 | 13.08 |
| 25 | 303.96 | 10.72 | 58 | 273.93 | 9.66 |
| 26 | 264.8 | 9.3 | 59 | 290.10 | 10.24 |
| 27 | 236.22 | 8.33 | 60 | 326.91 | 11.53 |
| 28 | 200.26 | 7.06 | 61 | 470.48 | 16.60 |
| 29 | 235.8 | 8.32 | 62 | 325.93 | 11.50 |
| 30 | 214.88 | 7.6 | 63 | 311.90 | 11.01 |
| 31 | 256.00 | 9.03 | 64 | 375.50 | 13.25 |
| 32 | 351.8 | 12.41 | 65 | 462.96 | 16.34 |
| 33 | 322.36 | 11.37 | 66 | 421.00 | 14.86 |

Naturally the weight does not always vary with the price. There are seven coats which cost $19.75. The lightest weight of these is No. 5 which weighs 6.7 ounces per square yard. Looking at the table we find only two coats which weigh less, namely, numbers 23 and 36. These cost $10.00 and $50.25 respectively. The heaviest of the $19.75 coats is number 45 which weighs 17.68 ounces. Numbers 44 and 46 are the only ones that weigh more. Thus among the coats of $19.75 value we find very nearly the extremes of weight. The average weight of the 27 which cost more than the average price is 12.01 ounces, while the average weight of the 39 that cost less than the average price is 10.59 ounces. This gives 1.42 ounces greater average for the higher priced garments.

At first it was attempted to buy coats with plain or twill weaves only, but this limited the choice of the garments. Fancy weaves have been worn so extensively that some of the simpler of these were chosen. Five knit coats of the weft knit type were bought. These are numbers 21, 32, 33, 54 and 62.

Plots of the weaves have been made. Beaumont[2] in his "Standard Cloths," page 47, states that the strength of the fabric, everything else being equal, "is proportionate to the number of warp and weft intersections." It was noticeable in material where the floats were fairly long that during abrasion the figured places were first to give way. This was most marked in the linings of 14 and 28.

The thread count was taken according to directions given on page 7 of the "Circular of the Bureau of Standards, No. 293." The

[2]Beaumont, Roberts, "Standard Cloths," London, Scott Greenwood and Sons.

**Table 3**

PICKS AND ENDS PER INCH IN COAT MATERIAL

| No. Coat | Picks Per In. | Ends Per In. | No. Coat | Picks Per In. | Ends Per In. |
|---|---|---|---|---|---|
| 1 | 20 | 21 | 34 | 25 1/2 | 40 1/3 |
| 2 | 16 2/3 | 17 1/3 | 35 | 40 | 40 |
| 3 | 55 2/3 | 127 2/3 | 36 | 54 2/3 | 77 2/3 |
| 4 | 23 2/3 | 26 2/3 | 37 | 52 1/2 | 59 1/3 |
| 5 | 66 | 127 2/3 | 38 | 15 1/3 | 16 1/6 |
| 6 | 23 | 25 4/9 | 39 | 29 | 36 |
| 7 | 30 | 18 5/9 | 40 | 15 1/3 | 14 2/3 |
| 8 | 28 | 31 2/3 | 41 | 16 8/9 | 25 1/6 |
| 9 | 32 | 32 2/3 | 42 | 23 2/3 | 33 1/6 |
| 10 | 36 2/3 | 52 | 43 | 26 1/2 | 24 1/3 |
| 11 | 25 | 27 2/3 | 44 | 28 1/6 | 29 5/6 |
| 12 | 28 | 33 1/3 | 45 | 32 | 37 |
| 13 | 16 1/3 | 25 2/3 | 46 | 21 | 27 |
| 14 | 33 1/3 | 59 2/3 | 47 | 26 1/6 | 28 5/6 |
| 15 | 25 1/3 | 53 | 48 | 16 1/3 | 21 |
| 16 | 22 1/3 | 23 7/9 | 49 | 17 1/2 | 21 5/12 |
| 17 | 21 11/12 | 21 1/3 | 50 | 16 1/3 | 20 1/3 |
| 18 | 16 | 16 | 51 | 13 | 17 |
| 19 | 19 2/9 | 21 7/9 | 52 | 19 | 26 |
| 20 | 19 | 17 5/9 | 53 | 43 | 22 |
| 21 | Knit | | 54 | Knit | |
| 22 | 40 1/3 | 41 1/3 | 55 | 48 | 56 |
| 23 | 45 1/3 | 54 1/3 | 56 | 25 | 28 |
| 24 | 32 1/3 | 35 2/3 | 57 | 34 | 30 |
| 25 | 16 2/3 | 14 | 58 | 17 | 20 |
| 26 | 33 1/3 | 19 1/3 | 59 | 24 | 30 |
| 27 | 40 | 71 1/3 | 60 | 32 | 28 |
| 28 | 41 2/3 | 115 | 61 | 29 | 40 |
| 29 | 30 | 31 | 62 | Knit | |
| 30 | 56 1/3 | 140 | 63 | 29 | 28 |
| 31 | 52 | 112 | 64 | 18 | 19 |
| 32 | Knit | | 65 | 22 | 24 |
| 33 | Knit | | 66 | 22 | 24 |

picks and ends were counted in one inch each direction. In fabrics where the thread count is under 25 the number of threads in three inches were counted and the results reduced to threads per inch. Three distinct counts were taken at more than six inches apart. The results are recorded in Table 3.

There are seventeen of the coat fabrics which have less than twenty picks per inch. These vary in price from $9.90 to $69.50. Thirteen have over forty picks per inch. The prices of these vary from $10.00 to $69.50. Thus among the coarsest weave of the fabrics we find the extremes of price and among the finest we have practically the extremes. If we compare the ends we find somewhat the same case.

**Table 4**

YARN COUNT OF COAT FABRICS

| | Warp | | | Filling | | |
|---|---|---|---|---|---|---|
| No. | Cotton Equivalent | Worsted Count | Woolen Runs | Cotton Equivalent | Worsted Count | Woolen Runs |
| 1 | 3.7 | | 1.94 | 3.3 | | 1.7 |
| 2 | 3.7 | | 1.94 | 3.4 | | 1.7 |
| 3 | 16.6 | 24.9 | | 20.15 | 30.1 | |
| | 4.2 blue | | | 4.2 blue | 2.2 | |
| 4 | 4.6 white | | 2.2 | 3.9 brown | 2.04 | |
| 5 | 18.7 | 28.1 | 2.4 | 20.1 | 30.1 | |
| | | | | 4.2 green | | 2.2 |
| 6 | 4.8 | | 2.5 | 3.8 brown | | 1.9 |
| 7 | 2.9 | | 1.5 | 3.7 | | 1.9 |
| 8 | 5.6 | | 2.9 | 4.9 | | 2.57 |
| 9 | 7.8 | 11.7 | | 7.1 | 10.6 | |
| 10 | 8.4 | | 4.4 | 7.1 | | 3.72 |
| 11 | 4.2 | | 2.2 | 4.1 | | 2.15 |
| 12 | 2.5 | | 1.3 | 2.1 | | 1.1 |
| | 2.8 white | | 1.4 | 2.8 white | | 1.47 |

**Table 4—Continued**
YARN COUNT OF COAT FABRICS

| | Warp | | | Filling | | |
|---|---|---|---|---|---|---|
| No. | Cotton Equivalent | Worsted Count | Woolen Runs | Cotton Equivalent | Worsted Count | Woolen Runs |
| 13 | 2.9 black | | 1.5 | 3.0 black | | 1.57 |
| 14 | 13.6 | 20.4 | | 7.1 | 10.6 | |
| | | | | 3.4 red | | |
| 15 | 6.3 | 9.4 | | 2.7 black | | 1.78 |
| 16 | 4.1 | | 2.15 | 4.1 | | 2.15 |
| | 3.5 white | | 1.8 | 3.14 white | | 1.64 white |
| 17 | 3.3 brown | | 1.7 | 3.3 brown | | 1.73 brown |
| | | | | 1.9 orange | | .99 |
| 18 | 2.04 | | 1.07 | 2.1 white | | 1.1 |
| 19 | 3.8 | | 1.9 | 3.3 | | 1.7 |
| 20 | 2.9 | | 1.5 | 2.6 | | 1.3 |
| 21 | | | | | | |
| 22 | 5. | | 2.6 | 5.6 | | 2.9 |
| 23 | 14.5 | | | 13.2 black | | |
| | cotton | | | 14.6 white | | |
| | combed | | | | | |
| 24 | 16.3 | | 3.3 | 4.6 | | 2.4 |
| 25 | 2.2 | | 1.15 | 1.8 | | .94 |
| 26 | 3.5 | | 1.8 | 4.5 | | 2.36 |
| 27 | 18.5 | 27.75 | | 8.5 | 12.7 | |
| 28 | 19.5 | 29.25 | | 19. | 28.5 | |
| 29 | 6. | | 3.15 | 6. | | 3.15 |
| 30 | 16. | 24. | | 20.5 | 30.7 | |
| 31 | 17.5 | 26.25 | | 16. | 24. | |
| 32 | | | | | | |
| 33 | | | | | | |
| 34 | 2.1 | | 1.1 | 2.6 | | 1.36 |
| 35 | 5.0 | | 2.6 | 7.1 | | 3.7 |
| 36 | 23. | 34.5 | | 11. | | 5.77 |
| 37 | 5.5 | 8.25 | | 4.6 | 6.9 | |
| 38 | 2.6 | 3.9 | | 2.6 | 3.9 | |
| 39 | 4.6 | | 2.41 | 3.8 | | 2.015 |
| 40 | 1.65 | 2.47 | | 1.7 | 2.55 | |
| 41 | 2.4 | 3.6 | | 2.4 | 3.6 | |
| 42 | 4.7 black | 7.05 | | 3.6 black | 5.4 | |
| | 3.7 gray | 5.55 | | 3.0 gray | 4.5 | |
| 43 | 1.7 | | .89 | 1.6 | | 1.4 |
| 44 | 2.2 brown | | 1.15 | 2.1 | | 1.10 |
| | 2.7 white | | 1.41 | | | |
| 45 | 2.4 | 3.6 | | 2.5 | 3.75 | |
| 46 | 1.75 | 2.62 | | 1.6 | 2.4 | |
| 47 | 3.8 | 5.7 | | 3.4 | 5.1 | |
| 48 | 2.2 | 1.15 | | 2.15 | | 1.12 |
| 49 | 2.5 | 3.75 | | 2.6 | 3.9 | |
| 50 | 2.3 | 3.45 | | 2.4 | 3.6 | |
| 51 | 1.82 | | .95 | 1.67 | | .87 |
| 52 | 2.89 | | 1.51 | 2.43 | | 1.27 |
| 53 | 2.4 | | 1.26 | 4.6 | | 2.41 |
| 54 | 4.6 knit | | 2.41 | | | |
| 55 | 6. | | 3.15 | 5.4 | | 2.83 |
| 56 | 3.4 | | 1.78 | 3.0 | | 1.57 |
| 57 | 3.8 | | 1.99 | 3.6 | | 1.89 |
| 58 | 2.8 | | 1.47 | 2.6 | | 1.36 |
| 59 | 3.8 | | 1.99 | 4.0 | | 2.10 |
| 60 | 7.2 | | 3.78 | 3.1 | | 1.62 |
| 61 | 4.5 | | 2.36 | 1.2 | | .63 |
| 62 | | | | | | |
| 63 | 3.8 | | 1.99 | 3.6 | | 1.89 |
| 64 | 2. | | 1.05 | 1.8 | | .94 |
| 65 | 2.1 | | 1.10 | 1.9 | | .99 |
| 66 | 2.4 | | 1.26 | 2.4 | | 1.26 |

To find the yarn count, the cotton equivalents were found on a yard quadrant. A piece of cloth 1/100 of a square yard was cut. Forty lengths of the warp and forty of the filling were drawn out and placed in separate groups on the proper hook of the quadrant. The reading gave the count for cotton of warp and filling respective-

ly. The worsted yarn number was found by multiplying the cotton equivalent by 1½, while the woolen runs were found by multiplying the cotton equivalent by .52½. The results are recorded in Table 4.

In looking at the yarn count, it will be found that the two highest priced coats, 19 and 53, have a count of 3.8 and 2.4 woolen runs respectively. These are among the finest of the woolens. However, number 10 has a finer woolen yarn. The price of this coat is $16.75, which is among the cheapest of the garments examined. Thus price is not necessarily an indication of the fineness of the woolen yarns.

The average price of the worsted coats examined is $2.28 more than the average price of the woolens but the former has an average of 10.45 pounds higher tensile strength than the latter.

The twist of the yarn was found by taking the average of five samples of three inches each. Each sample was placed in a twist machine with a weight according to the size of the yarn. In a few cases where the staple was very short it was found necessary to find the number of twists in one inch and increase the number of samples to fifteen. Medium twist is considered the best wearing (Johnson "Textile Fabrics")[3]; very tightly woven yarn is less durable. This was particularly noticeable in No. 27, which has a very high tensile strength but upon being rubbed 210 times becomes 75 per cent weaker. The tabulation of the number of twists per inch is recorded in Table 5. L indicates left hand twist and R right hand twist.

The length of the fibers is one of the factors that affects the strength of the fabric. M. J. Matthews[4] in "The Textile Fibers," says, "Other conditions being equal the strength of a thread will be directly proportional to the length of the individual fiber elements employed." Short fibers may be found in high priced fabrics as in the case of lamb's wool. Then, too, the length of the fiber may be dependent upon the breed of sheep, frequency of the clip and the grade of the wool, whether it be "virgin" or "reworked" wool.

[3]Johnson, Geo. H., "Textile Fabrics," New York, Harper and Brothers, 1927.

[4]Matthews, Merritt J., "The Textile Fibers, New York, J. Wiley & Sons, 1924.

**Table 5**

DIRECTION AND NUMBER OF TWISTS PER INCH

| | Warp | | Fillings | |
|---|---|---|---|---|
| Coat | Direction | Twists Per Inch | Direction | Twists Per Inch |
| 1 | L | 7 | L | 5 4/5 |
| 2 | L | 8 | L | 7 2/5 |
| 3 | L | 12 1/5 | R | 9 4/5 |
| 4 | L | 10 | L | 9 |
| 5 | L | 12 | R | 9 |
| 6 | L | 11 | L | 8 7/10 |
| 7 | L | 7 | L | 8 Silk |
| | | | | 7 2/3 single |
| | | | | 6 2/5 wool |
| 8 | L | 9 2/5 | L | 9 |
| 9 | L | 7 4/5 | L | 4 1/5 |
| 10 | L | 10 1/5 | L | 8 2/5 |
| 11 | L | 8 1/2 | L | 7 |
| 12 | L | 6 1/5 | L | 5 1/2 |
| 13 | R | 6 1/5 | R | 6 |
| | Single L | 8 3/5 | L | 8 1/5 |

**Table 5—Continued**

DIRECTION AND NUMBER OF TWISTS PER INCH

| | Warp | | Fillings | |
|---|---|---|---|---|
| Coat | Direction | Twists Per Inch | Direction | Twists Per Inch |
| 14 | L | 15 2/5 | R | 9 |
| | Single L | 8 4/5 | | |
| 15 | L | 8 2/5 | R | 6 1/5 |
| | Single R | 9 | | |
| 16 | L | 8 2/5 | L | 9 |
| 17 | Brown L | 11 | L | 13 |
| | White L | 10 | | |
| 18 | L | 6 | L | 6 |
| | Single R | 8 1/5 | Single R | 6 3/5 |
| 19 | L | 8 1/5 | L | 8 2/5 |
| | Single R | 8 | R | 9 |
| 20 | R | 4 3/5 | R | 4 |
| | Single L | 10 | L | 8 |
| 21 | Knit | | L | 7 |
| 22 | L | 13 1/5 | L | 10 2/5 |
| 23 | L | 20 | L | 18 3/10 |
| | Single R | 18 | Single R | 15 1/10 |
| 24 | R | 15 3/5 | L | 13 2/10 |
| 25 | L | 5 | L | 5 |
| | Single R | 9 | Single R | 8 5/10 |
| 26 | L | 10 | L | 8 |
| 27 | L | 16 | R | 16 |
| | Single R | 12 | Single R | 14 |
| 28 | L | 14 1/5 | R | 16 2/5 |
| 29 | R | 8 | R | 8 |
| 30 | L | 14 4/5 | R | 12 3/5 |
| 31 | L | 14 1/5 | R | 11 |
| 32 | Knit | | R | 6 4/5 |
| 33 | Knit | | L | 6 3/5 |
| 34 | L | 8 3/5 | L | 7 1/5 |
| 35 | L | 10 3/5 | R | 8 1/5 |
| 36 | R | 12 1/2 | L | 8 4/5 |
| 37 | L | 11.2 | L | 10.1 |
| 38 | L | 4.1 | L | 6 |
| | Single R | 9.5 | Single R | 6.5 |
| 39 | R | 9 | R | 6 |
| 40 | L | 5 | L | 6 |
| 41 | L | 6 | L | 6 |
| 42 | L | 7 | L | 5 |
| | Single R | 7 | Single R | 5 |
| 43 | L | 7 | L | 5 |
| 44 | R | 6.8 | R | 7 |
| 45 | L | 8 | L | 8 |
| 46 | L | 6 | L | 6 |
| 47 | L | 8.2 | L | 9 |
| 48 | L | 9 | L | 8 |
| 49 | L | 8 | L | 8 |
| 50 | L | 8.1 | L | 7.5 |
| 51 | L | 5 | L | 4 1/5 |
| | Single R | 10 | | |
| 52 | L | 8 | L | 7 |
| 53 | R | 5 | L | 7 1/5 |
| | Single L | 5 | | |
| 54 | Weft Knit | | L | 6 |
| 55 | L | 16 | L | 12 |
| 56 | R | 5 | R | 6 |
| | Single L | 8 | L | 8 |
| 57 | R | 11 | R | 10 |
| 58 | L | 6 | R | 3 |
| | | | L | 8 |
| 59 | R | 7 | R | 6 |
| 60 | L | 12 | L | 7 |
| 61 | L | 9 | R | 6 1/2 |
| | | | L | 6 1/2 |
| 62 | Weft Knit | | R | 8 |
| 63 | R | 4 | R | 5 |
| 64 | R | 6 | R | 6 |
| | Single L | 4 | L | 5 |
| 65 | L | 6 | L | 7 |
| 66 | L | 8 | L | 7 |

**Table 6**

LENGTH OF STAPLE IN INCHES

| No. | Warp | Filling | No. | Warp | Filling |
|---|---|---|---|---|---|
| 1 | 1 6/7 | 1 1/8 | 34 | 1 | 7/8 |
| 2 | 1 5/8 | 1 1/8 | 35 | 1 5/16 | 1 |
| 3 | 1 1/4 | 7/8 | 36 | 1 3/32 | 15/16 |
| 4 | 1 | 7/8 | 37 | 1 1/4 | 1 1/8 |
| 5 | 1 5/16 | 1 1/2 | 38 | 1 5/8 | 1 1/2 |
| 6 | 1 1/16 | 1 5/32 | 39 | 5/8 | 1/2 |
| 7 | 1 3/16 | 1 15/16 | 40 | 1 7/16 | 1 1/8 |
| 8 | 1 | 7/8 | 41 | 1 3/4 | 1 3/8 |
| 9 | 2 7/16 | 1 1/4 | 42 | 1 5/8 | 7/8 |
| 10 | 1 1/8 | 7/8 | 43 | 1 1/8 | 3/4 |
| 11 | 1 3/32 | 15/16 | 44 | 1 3/8 | 15/16 |
| 12 | 9/32 | 5/16 | 45 | 1 5/16 | 7/8 |
| 13 | 7/16 | 7/8 | 46 | 1 1/16 | 15/16 |
| 14 | 1/8 | 1 1/6 | 47 | 1 1/8 | 7/8 |
| 15 | 7/8 | 1 3/16 | 48 | 1 5/16 | 1 1/16 |
| 16 | 15/16 | 9/16 | 49 | 1 1/16 | 7/8 |
| 17 | Cotton 9/16 | 9/16 | 50 | 1 | 13/16 |
| 18 | 1 7/16 | 1 | 51 | 1 3/16 | 1 1/8 |
| 19 | 1 | 15/16 | 52 | 1 1/8 | 7/8 |
| 20 | 1 3/4 | 1 3/8 | 53 | 2 1/16 | 1 1/4 |
| 21 | 1 15/16 | Knit | 54 | Knit | 2 1/16 |
| 22 | 1 1/16 | 9/16 | 55 | 7/8 | 7/8 |
| 23 | 1 3/16 | 3/4 | 56 | 1 3/16 | 1 1/8 |
| 24 | 5/16 | 5/16 | 57 | 1 | 15/16 |
| 25 | 1 5/8 | 1 3/16 | 58 | 1 1/8 | 7/8 |
| 26 | 1 1/32 | 15/16 | 59 | 1 1/16 | 1 |
| 27 | 1 5/16 | 7/8 | 60 | 1 1/4 | 1 1/8 |
| 28 | 1 1/4 | 1 1/8 | 61 | 1 | 7/8 |
| 29 | 1 5/32 | 1 3/32 | 62 | Knit | 1 1/4 |
| 30 | 1 | 1 | 63 | 2 3/8 | 2 5/8 |
| 31 | 1 1/8 | 1 3/8 | 64 | 1 3/4 | 1 1/16 |
| 32 | Knit | 15/16 | 65 | 1 1/8 | 1 1/16 |
| 33 | Knit | 3/4 | 66 | 1 | 1 1/16 |

The approximate length of the staple is recorded in Table 6. Long fibers as in numbers 9, 15, 53 and 63 make stronger yarn than short fibers as in 12, 24, 39 and 55. In looking at the price of these garments it is found that 9 and 15 are below the average in cost, while 53 and 63 are far above the average. Then in those of short fibers number 55 is below the average, while 12, 24, and 39 are above the average in price. It is evident that the length of staple is not determined by the price in this group of garments.

In making the miscroscopic study the diameter of the fiber was measured. Note was also made of the prevalence of split and broken ends, uneven diameters in individual fibers, and absence of epidermal cells. Measurement of the width of the fibers was made by the use of an eyepiece micrometer. The magnification was first found by the use of a stage micrometer with an eyepiece micrometer. Measurements of fibers which had been graded by comparing with official standards of the United States grades of wool were first made. The diameter of the largest, medium and smallest fibers was taken in order to get the variation of width. Medium represents

**Table 7-A**

DIAMETERS OF SOME OF THE STANDARD GRADES OF WOOL

| Grades | Millimeters |
|---|---|
| Fine staple or 80's, 70's, 64's | .016 |
| One-half blood or 60's, 58's | .024 |
| Three-eighths or 56's | .032 |
| One-fourth or 50's, 48's | .048 |
| Braid or 40's, 36's | .056 |

the size of the majority of fibers. Table 7-A gives the width in millimeters of some of the standard grades. Table 7-B gives the width of the fibers in the various coats.

Ten of the coats showed some fibers with a diameter of .1 mm., or above. They are numbers 1, 2, 44, 45, 51, 52, 53, 55, 59 and 60. The average price of these ten is $26.08. Three have fibers whose average size is .016 mm. The average price of the three is $51.58. None of the cheaper garments is included with those of a fine fiber average. The table shows number 23 to have fine fibers but these are cotton and therefore were not included with the three.

**Table 7-B**

DIAMETER OF FIBERS IN MM.

| | Warp | | | Filling | | |
|---|---|---|---|---|---|---|
| No. | Largest | Medium | Smallest | Largest | Medium | Smallest |
| 1 | .112 | .032 | .016 | .112 | .04 | .016 |
| 2 | .056 | .04 | .016 | .112 | .032 | .016 |
| 3 | .024 | .016 | .016 | .024 | .016 | .016 |
| 4 | blue .056 | .04 | .016 | | | |
| | brown.048 | .056 | .016 | .048 | .04 | .016 |
| 5 | .04 | .024 | .016 | .048 | .036 | .016 |
| 6 | .048 | .024 | .016 | .056 | .032 | .016 blue |
| | | | | .064 | .04 | .024 brown |
| | | | | .056 | .032 | .024 black |
| 7 | .056 | .024 | .024 | .064 | .024 | .024 |
| 8 | .032 | .024 | .016 | .064 | .04 | .016 |
| 9 | .04 | .024 | .024 | .064 | .032 | .016 |
| 10 | .024 | .024 | .016 | .032 | .024 | .016 |
| 11 | .056 | .024 | .016 | .056 | .024 | .016 |
| 12 | .064 | .032 | .016 | .032 | .024 | .016 |
| 13 | .032 | .024 | .016 | .048 | .032 | .016 |
| 14 | .048 | .032 | .016 | .048 | .032 | .016 |
| 15 | .048 | .024 | .016 | .032 | .024 | .016 |
| 16 | .080 | .048 | .032 | .08 | .048 | .016 |
| 17 | .032 | .016 | .016 | .08 | .048 | .016 |
| 18 | .096 | .048 | .016 | .064 | .032 | .016 orange |
| | .048 | .032 | .016 | .048 | .032 | .016 white |
| 19 | .032 | .016 | .016 | .032 | .016 | .016 |
| 20 | .048 | .032 | .016 | .096 | .048 | .024 |
| 21 | Knit | Knit | | .032 | .024 | .016 |
| 22 | .032 | .016 | .016 | .048 | .032 | .016 |
| 23 | .032 | .016 | .016 | .036 | .016 | .016 black |
| 24 | .048 | .032 | .016 | .032 | .016 | .016 |
| 25 | .08 | .04 | .024 | .056 | .032 | .016 white |
| | .048 | .04 | .016 | .04 | .024 | .016 brown |
| 26 | .048 | .024 | .016 | .048 | .032 | .016 black |
| | | | | .056 | .04 | .024 white |
| 27 | .032 | .024 | .016 | .024 | .016 | .016 |
| 28 | .048 | .024 | .016 | .032 | .024 | .016 |
| 29 | .048 | .032 | .024 | .032 | .024 | .016 |
| 30 | .032 | .024 | .016 | .032 | .024 | .016 |
| 31 | .032 | .024 | .016 | .048 | .032 | .016 |
| 32 | Knit | Knit | Knit | .032 | .024 | .016 |
| 33 | Knit | Knit | Knit | .032 | .024 | .016 |
| 34 | .048 | .032 | .016 | .032 | .024 | .016 |
| 35 | .032 | .016 | .016 | .032 | .024 | .016 |
| 36 | .024 | .016 | .016 | .024 | .016 | .016 |
| 37 | .068 | .032 | .016 | .068 | .040 | .016 |
| 38 | .040 | .028 | .016 | .048 | .032 | .016 |
| 39 | .040 | .032 | .016 | .048 | .032 | .016 |
| 40 | .048 | .035 | .020 | .056 | .032 | .008 |
| 41 | .064 | .032 | .016 | .048 | .040 | .016 |
| 42 | .048 | .032 | .020 | .056 | .032 | .016 |
| 43 | .048 | .032 | .016 | .048 | .032 | .016 |
| 44 | .056 | .036 | .016 | .112 | .040 | .016 |
| 45 | .072 | .036 | .016 | .112 | .040 | .016 |
| 46 | .056 | .030 | .016 | .052 | .036 | .016 |
| 47 | .072 | .032 | .016 | .080 | .036 | .012 |

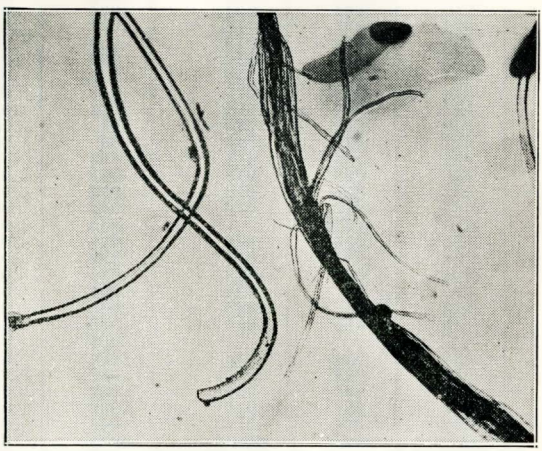
**Table 7-B—Continued**

DIAMETER OF FIBERS IN MM.

| | Warp | | | Filling | | |
|---|---|---|---|---|---|---|
| No. | Largest | Medium | Smallest | Largest | Medium | Smallest |
| 48 | .060 | .040 | .016 | .064 | .032 | .020 |
| 49 | .064 | .032 | .016 | .096 | .036 | .016 |
| 50 | .064 | .032 | .016 | .072 | .036 | .016 |
| 51 | .128 | .040 | .016 | .080 | .032 | .016 |
| 52 | .112 | .032 | .024 | .112 | .032 | .024 |
| 53 | .080 | .040 | .016 | .112 | .040 | .016 |
| 54 | Weft | Knit | | .040 | .032 | .024 |
| 55 | .104 | .036 | .016 | .072 | .040 | .016 |
| 56 | .080 | .040 | .024 | .072 | .040 | .024 |
| 57 | .040 | .032 | .016 | .048 | .032 | .016 |
| 58 | .080 | .040 | .024 | .080 | .036 | .024 |
| 59 | .096 | .040 | .040 | .120 | .036 | .024 |
| 60 | .044 | .040 | .016 | .144 | .040 | .016 |
| 61 | .048 | .032 | .016 | .064 | .040 | .016 |
| 62 | Weft | Knit | | .044 | .032 | .016 |
| 63 | .048 | .040 | .024 | .048 | .040 | .016 |
| 64 | .064 | .040 | .016 | .056 | .040 | .016 |
| 65 | .080 | .032 | .016 | .056 | .040 | .016 |
| 66 | .080 | .032 | .016 | .048 | .032 | .016 |

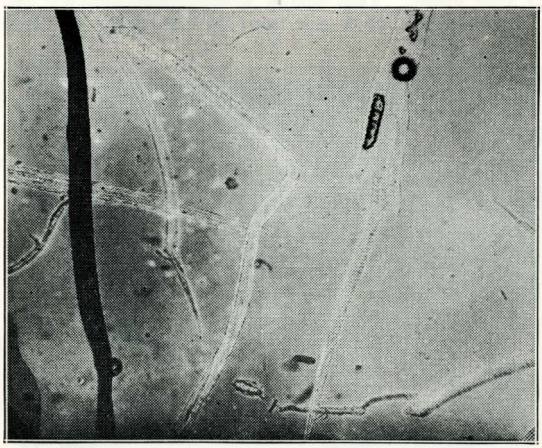
The variation of width of fibers is greater in the coarse, harsh fabrics as those in coats 1, 2, 4, 7, 11, 12, 16, 17, 18, 25 and 51. In these we find some of the fine staple and some of the very coarse. The variation is not so great in the worsteds and fine staple woolens, namely: 3, 5, 10, 19, 21, 22 and 36.

Coats 3, 5, 9, 14, 19, 22, 24, 27, 28, 30, 36 and 63 showed no brush ends in the five slides from filling and five from warp of each coat. All the others showed some. Coats 21 and 32 were guaranteed "100 per cent virgin wool." The number of brush ends was very small in these two garments. While care was exercised in preparing the slides some of the fabrics were felted so as to make it necessary to break some of the fibers in separating them.



Photographs have been taken of some of the incomplete fibers. Photograph No. 1 was taken from a slide prepared from the warp of No. 2. Photograph No. 2 is from the warp of No. 7. These coats were quite similar in appearance. Both were a tan tweed mixture of plain weave in plain mannish cut. No. 2 cost $9.90 and No. 7, $45.00. No. 2 did not test as high in most instances and showed more of the damaged fibres. The photograph shows that they were not entirely absent from No. 7.

Photograph No. 3 shows a few fibers from the filling of coat No. 2. In contrast to the photographs, No. 4 shows a few fibers from the warp of coat No. 3. The fibers here are fairly even in diameter and are quite nearly parallel. The fibers were disarranged somewhat by laying on of the coverslip.



The chemical tests were done by the experimental chemist in the chemistry department. The method is as follows: Two to three gram samples were weighed out into a glass stoppered bottle and dried in the oven at 105° until constant weight was obtained. The loss of weight represented the per cent of moisture.

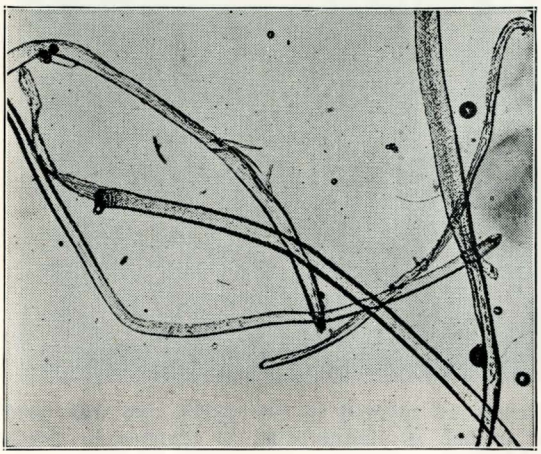
The moisture samples were divided in two parts, one was used in determining per cent of ash by incinerating in furnace to check filler and the other half was for fibres.

The samples were now boiled in a 1 per cent hydrochloric acid solution for fifteen minutes, filtered and washed in water once and boiled once more for fifteen minutes in the hydrochloric solution, removed from this solution and washed free of acid. Very little of the coloring matter was removed by this treatment. The samples were now boiled for fifteen minutes in a 5 per cent solution of sodium carbonate, removed from this solution and thoroughly washed successively with hot water, alcohol and ether, and dried in the oven to constant weight and loss in weight calculated as filler and dyes.

To remove the silk the samples were placed in 50 cc of basic zinc chloride solution already at the boiling point, stirred for one minute and then brought to the boiling point. They were now filtered through a previously weighed Gooch crucible, and then washed in five different portions and concentrations of hydrochloric acid, beginning with a 5 per cent solution, and thereafter using each time a more dilute solution. The samples were now washed free of chlorides and then with alcohol and ether, and dried to constant weight and the loss in weight calculated as the per cent of silk.

To remove the wool from the cotton the samples were boiled for fifteen minutes in a 5 per cent solution of potassium hydroxide, filtered through a Gooch crucible, using glass wool as a mat. The loss in weight represented the per cent of wool. The results are given in Table 8.

Of the sixty-six coats examined only seventeen have enough cotton to weigh. In some of these as 51 and 61, the cotton was used as one or two singles in 3 ply novelty yarn. The average amount of cotton in the coats below the average price is 3.59 per cent, while for those above the average price the amount of cotton is 3.32 per cent. This gives a decrease of .27 per cent in cotton for an increase of 109.9 per cent in the price of the garments.

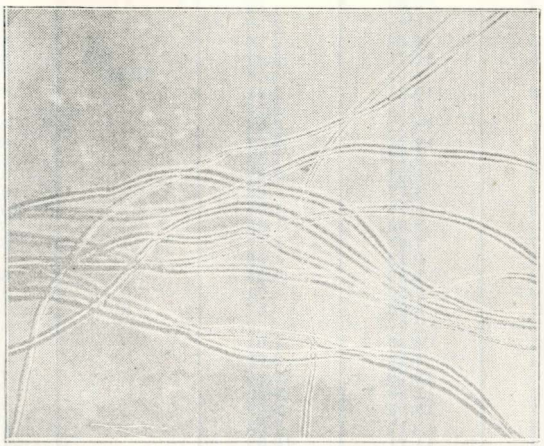


The tensile strength was found by using the strip method as described pages 5-7 in United States Bureau of Standards, Circular No. 293, which gives the Federal Specifications, board Specifications No. 345. The length of test specimens was nine inches with a distance of six inches between the jaws. Where the number of threads per inch is above 50, the width of specimens before raveling was 1¼ inches. All the others were 1½ inches. Each piece was raveled to exactly one inch by raveling an equal amount on each side of the strip. Six strips were cut on the length and six on the width and the average of the six tests is recorded in Table No. 9. Comparisons of tensile strength have been made on machine readings.

The strongest according to this test is number 15. Lengthwise it tests 90½ pounds and cost $25.00. The lowest lengthwise test is 5¼ pounds. This is coat number 60 and it cost $24.75. Crosswise the highest test is 67 11/12 and the lowest 3 5/6. The former cost $45.00 and the latter $49.50. Price is no indication of strength in these four. In the average of a larger group the high priced garments show up better.

The average price of the sixty-six coats examined is $29.52. There are thirty-nine coats that cost less than that price and twenty-seven that cost more. In comparing the tensile strength of the two groups we find that the cheaper has an average strength lengthwise of 30.67 pounds, while the other has a tensile strength of 33.65 pounds, or an advantage of 2.98 pounds in favor of the higher priced group. Crosswise the difference is less. The first group has an average of 20.30 pounds, while the latter an average of 20.63 or .33 pounds, stronger than the cheaper group. But for this slight increase in strength there is a much greater increase in price. Those above the average in price average $42.70 each, while those below

average $20.39. This makes an increase of $22.41 in price for an increase of 2.98 pounds strength lengthwise and .33 pounds widthwise. In terms of percentage the increase lengthwise is 9.7 per cent and widthwise is 1.6 per cent for an increase of 109.9 per cent in price.



Five of the coats were of weft knit fabric. These were given the bursting test. The machine used was a ball burst tester attachment for the pendulum type of cloth tester. The bursting strength was found in pounds per square inch in five different places in the garment. The average of the five is recorded in Table 10. Coats 21 and 32 were guaranteed "100 per cent virgin wool." These two do test better than numbers 33 and 44 and their price is less. The fact that the others were not labeled "100 per cent virgin wool" does not necessarily mean that they were reworked wool. The microscopic examination showed the conditions of the fibers to be very similar in those five coats. All were felted considerably and made the separation of the fibers very difficult. All showed a few brush ends.

The abrasion test was given by rubbing the fabric 210 times with 2/0 emery cloth and then testing the tensile strength. A clothes mangle, with the strips of emery cloth pasted on, served to give the wearing test. One end of the fabric to be tested was fastened securely with a clamp, the piece hung over the revolving drum, and the other end was weighted with a 7½ ounce weight. After rubbing over 11 inches of 2/0 emery cloth and 12 inches of muslin 210 times the strips were raveled to exactly one inch and tested in a cloth tester. Column one of Table 11 gives the result of this test. Some of the fabrics lost three-fourths their orginal strength, while others lost only one or two pounds. All, however, lost some of their strength.

Weathering did not affect the tensile strength in the same way. Most of the fabrics were weakened but a few gained in strength. This was probably due to shrinkage. Nos. 2 and 10 shrank 10 per cent and 10.1 per cent of their length in weathering which probably accounts for added tensile strength.

**Table 8**

RESULTS CHEMICAL ANALYSIS OF COAT FABRICS

| No. | Moisture % | Filler & Dye | Silk | Wool | Cotton |
|---|---|---|---|---|---|
| O.D. | 9.00 | 1.36 | | 89.64 | 00.00 |
| 1 | 10.84 | .71 | 2.87 | 85.58 | 00.00 |
| 2 | 11.22 | 1.43 | | 87.35 | Trace |
| 3 | 9.97 | 1.53 | | 88.50 | 00.00 |
| 4 | 10.74 | 2.50 | | 86.75 | Trace |
| 5 | 9.88 | 4.76 | | 85.38 | 00.00 |
| 6 | 10.71 | 3.01 | | 86.28 | Trace |
| 7 | 9.64 | 4.56 | 12.08 | 73.72 | 00.00 |
| 8 | 10.31 | 2.41 | | 87.28 | Trace |
| 9 | 10.14 | 2.13 | | 87.73 | 00.00 |
| 10 | 10.11 | 3.04 | | 86.84 | 00.00 |
| 11 | 10.71 | 2.81 | | 86.47 | Trace |
| 12 | 9.17 | 1.34 | | 89.49 | |
| 13 | 9.61 | 3.27 | | 87.12 | |
| 14 | 8.77 | .62 | | 90.61 | |
| 15 | 9.14 | 1.05 | | 64.89 | 24.92 |
| 16 | 9.00 | 1.30 | | 88.15 | 1.55 |
| 17 | 7.60 | 2.20 | | 87.60 | 2.60 |
| 18 | 9.13 | .56 | | 90.31 | |
| 19 | 8.22 | 1.94 | | 89.84 | |
| 20 | 9.30 | .21 | | 90.49 | Trace |
| 21 | 9.05 | .57 | | 89.7 | .68 |
| 22 | 8.97 | .67 | | 88.85 | 1.51 |
| 23 | 4.80 | 2.61 | | 7.04 | 85.55 |
| 24 | 9.23 | 2.50 | | 88.27 | 00.00 |
| 25 | 12.70 | 10.20 | | 77.00 | 00.10 |
| 26 | 11.98 | 10.69 | | 77.33 | 00.00 |
| 27 | 10.85 | 9.49 | | 79.65 | 00.00 |
| 28 | 11.11 | 7.22 | | 81.67 | 00.00 |
| 29 | 11.71 | 10.39 | | 77.90 | 00.00 |
| 30 | 11.78 | 7.94 | | 80.28 | 00.00 |
| 31 | 11.27 | 8.42 | | 80.31 | 00.00 |
| 32 | 11.65 | 8.89 | | 79.46 | 00.00 |
| 33 | 12.14 | 9.61 | | 78.20 | 00.06 |
| 34 | 10.89 | 7.71 | | 80.00 | 1.40 |
| 35 | 10.35 | 7.30 | | 82.35 | 00.00 |
| 36 | 10.12 | 8.18 | | 81.65 | .05 |
| 37 | 10.71 | 18.38 | | 70.91 | 0.00 |
| 38 | 12.32 | 16.14 | | 71.54 | 0.00 |
| 39 | 9.96 | 17.52 | | 72.52 | 0.00 |
| 40 | 12.19 | 14.78 | | 73.03 | 0.00 |
| 41 | 11.05 | 16.16 | | 72.79 | 0.00 |
| 42 | 10.25 | 9.42 | | 60.93 | 19.40 |
| 43 | 10.55 | 11.04 | | 75.30 | 3.11 |
| 44 | 11.18 | 9.90 | | 78.92 | 0.00 |
| 45 | 10.69 | 12.77 | | 75.09 | 1.45 |
| 46 | 11.10 | 10.78 | | 78.12 | 0.00 |
| 47 | 11.29 | 14.73 | | 73.98 | 0.00 |
| 48 | 11.28 | 10.54 | | 78.18 | 0.00 |
| 49 | 11.16 | 13.62 | | 75.22 | 0.00 |
| 50 | 11.06 | 8.64 | | 80.30 | 0.00 |
| 51 | 7.00 | 4.31 | | 68.60 | 20.09 |
| 52 | 7.99 | 7.82 | | 84.19 | 0.00 |
| 53 | 7.86 | 5.08 | | 87.08 | 0.00 |
| 54 | 8.11 | 6.74 | | 85.15 | 0.00 |
| 55 | 7.52 | 1.38 | | 91.10 | 0.00 |
| 56 | 7.80 | 10.28 | | 82.92 | 0.00 |
| 57 | 7.63 | 5.72 | | 63.96 | 22.69 |
| 58 | 7.52 | 13.82 | | 44.88 | 33.77 |
| 59 | 7.94 | 8.34 | | 83.72 | 0.00 |
| 60 | 7.54 | 6.14 | | 86.32 | 0.00 |
| 61 | 8.16 | 10.36 | | 70.55 | 10.93 |
| 62 | 7.98 | 6.87 | | 85.15 | 0.00 |
| 63 | 7.72 | 5.91 | | 86.37 | 0.00 |
| 64 | 7.34 | 7.12 | | 85.54 | 0.00 |
| 65 | 7.57 | 11.91 | | 80.52 | 0.00 |
| 66 | 6.45 | 6.55 | | 87.00 | 0.00 |

The weathered fabrics were then rubbed 210 times as mentioned above and the tensile strength taken. This showed a decrease in tensile strength of 42 2/3 and 44 pounds in 27 and 28 respec-

**Table 9**

TENSILE STRENGTH, STRIP METHOD

| No. | Warp | Filling |
|---|---|---|
| 1 | 32 5/12 | 27 1/12 |
| 2 | 15 1/6 | 18 1/12 |
| 3 | 74 11/24 | 17 1/4 |
| 4 | 18 1/6 | 17 7/12 |
| 5 | 61 11/12 | 22 7/24 |
| 6 | 15 | 15 7/24 |
| 7 | 29 11/12 | 67 11/12 |
| 8 | 32 1/4 | 24 1/12 |
| 9 | 42 1/8 | 33 1/6 |
| 10 | 38 5/6 | 21 5/6 |
| 11 | 19 5/8 | 11 5/24 |
| 12 | 28 23/48 | 20 11/12 |
| 13 | 42 1/6 | 14 3/4 |
| 14 | 33 11/24 | 21 1/24 |
| 15 | 90 1/2 | 19 3/8 |
| 16 | 21 11/12 | 12 1/6 |
| 17 | 22 1/3 | 26 5/12 |
| 18 | 30 1/4 | 28 5/12 |
| 19 | 23 2/3 | 18 17/24 |
| 20 | 35 1/3 | 35 1/3 |
| 21 | Knit | Knit |
| 22 | 33 13/24 | 31 1/6 |
| 23 | 50 1/6 | 38 1/4 |
| 24 | 15 13/24 | 14 1/8 |
| 25 | 20 1/3 | 24 3/4 |
| 26 | 13 7/12 | 20 1/6 |
| 27 | 60 2/3 | 22 1/2 |
| 28 | 53 1/3 | 28 5/6 |
| 29 | 18 1/9 | 21 1/2 |
| 30 | 69 23/24 | 12 1/2 |
| 31 | 52 1/12 | 14 3/4 |
| 32 | Knit | Knit |
| 33 | Knit | Knit |
| 34 | 37 5/9 | 9 7/8 |
| 35 | 13 5/9 | 15 13/24 |
| 36 | 20 1/3 | 8 11/24 |
| 37 | 30 1/6 | 26 1/2 |
| 38 | 16 5/12 | 10 1/6 |
| 39 | 9 | 7 1/2 |
| 40 | 12 1/2 | 10 1/8 |
| 41 | 22 1/3 | 11 5/12 |
| 42 | 33 1/3 | 21 5/6 |
| 43 | 38 1/2 | 21 1/2 |
| 44 | 22 5/6 | 20 3/8 |
| 45 | 39 1/6 | 26 11/12 |
| 46 | 44 1/12 | 25 1/6 |
| 47 | 15 1/12 | 8 1/6 |
| 48 | 15 19/24 | 7 1/2 |
| 49 | 11 1/4 | 4 7/12 |
| 50 | 18 1/4 | 8 |
| 51 | 25 1/3 | 11 19/24 |
| 52 | 18 1/2 | 16 1/6 |
| 53 | 61 5/6 | 28 1/2 |
| 54 | Knit | |
| 55 | 26 1/3 | 23 2/3 |
| 56 | 33 1/2 | 28 2/3 |
| 57 | 39 | 13 5/8 |
| 58 | 23 1/3 | 3 5/6 |
| 59 | 27 2/3 | 17 5/12 |
| 60 | 5 1/4 | 18 1/2 |
| 61 | 25 1/6 | 25 1/3 |
| 62 | Knit | |
| 63 | 58 1/2 | 41 1/6 |
| 64 | 39 1/6 | 12 1/2 |
| 65 | 30 1/2 | 27 1/2 |
| 66 | 44 | 33 |

tively, while Nos. 16, 18, 19, 22, 24, 25, 26, 35, 36, 40 and 41 lost only a fraction of a pound. Number 27 cost $59.50 and 28 cost $15.00. Of those that lost a fraction of a pound seven are among the high priced coats, while four are among the low priced.

**Table 10**

BURSTING STRENGTH IN POUNDS PER SQUARE YARD

| No. | Pounds Per Sq. In. to break | Same After Weathering 1Month | Price of Garment |
|---|---|---|---|
| 21 | 55½ | 52½ | $39.75 |
| 32 | 63½ | 54½ | 29.75 |
| 33 | 55½ | 52 | 49.75 |
| 54 | 54½ | 51½ | 49.50 |
| 62 | 45½ | 44 | 15.00 |

The last 16 of the coats were tested on an abrasion tester and were not included in the above. The average tensile strength after abrasion of the high priced group is 29.7. After weathering 30 days and then rubbed 100 times the tensile strength was 28.3 pounds. Among the low priced garments the tensile strength after abrasion is 22.3 pounds, while after weather and abrasion is 19.1 pounds. The high priced garments tested 33 per cent better in abrasion test and 48 per cent better in weathering and abrasion.

A combination of chemical and mechanical methods[5] of testing was given to aid in determining the durability of fabrics. Three pieces 5x23 cm on the length of the cloth were used. These cuttings were treated for 45 minutes at 94° C with 10 per cent of HCL U. S. P. in liquid 40 times the weight of the cloth. The cloth was then rinsed in distilled water until almost neutral. The water was squeezed out and the fat extracted in a soxhlet apparatus for 1½ hours or until alcohol remained clear on condensing. The material was turned inside out after the first 45 minutes. The samples were rinsed and dried for two hours at 65 to 70 degrees centigrade. After being kept in the oven at 25° C for one-half hour they were rubbed until the breaking occurred. The number of revolutions necessary to break the fabrics were noted and the average taken. The results are recorded in Table No. 12.

A piece of 20 ounce O. D. Milton used in enlisted men's uniforms was tested for comparison. The strongest coat material under this test was only about three-fourths as strong as the O. D. Milton. The weakest is a little less than one-seventh the strength of the O. D.

To test the fabric for ability to withstand showers the drop test[6] was used. The cloth was laid upon blotting paper on a glass plate, supported at an angle of 45°. A mirror was placed beneath in a horizontal position. Water was dropped five feet from a burette on to the cloth at the rate of 20 drops a minute. A count was made to determine the number of drops necessary to pass through the cloth and stain the blotting paper, which could be viewed in the mirror. An average of ten tests is recorded in Table 13.

Wetting through with 6.4 drops is sufficiently impermeable for most purposes. The war office tests requires 60 drops. The heaviest materials as 34, 12, 21, 33, 22 and those with rather heavy pile as 14 and 24 are the nearest impermeable.

[5]Posselt, E. A., "Fabric Analysis," Philadelphia, Textile Publishing Company.

[6]Matthews, Merritt J., "The Textile Fibers," New York, J. Wiley & Sons, 1924.

**Table 11**

TENSILE STRENGTH AFTER VARIOUS TREATMENTS

| No. | Rubbed 210 Times | Weathered 30 Days | Weathered 30 Days and Rubbed 210 Times | Tensile Strength of New Material |
|---|---|---|---|---|
| 1 | 16 5/12 | 28 | 17 1/3 | 32 5/12 |
| 2 | 9 5/12 | 16 1/3 | 11 | 15 1/6 |
| 3 | 42 | 73 | 46 | 74 11/24 |
| 4 | 9 2/3 | 17 7/12 | 9 1/3 | 18 1/6 |
| 5 | 28 7/24 | 55 1/3 | 31 1/6 | 61 11/12 |
| 6 | 11 1/6 | 14 11/12 | 11 | 15 |
| 7 | 27 1/6 | 25 | 23 5/12 | 29 11/12 |
| 8 | 26 5/12 | 32 | 26 1/6 | 32 1/4 |
| 9 | 40 1/6 | 41 5/6 | 40 1/12 | 42 1/8 |
| 10 | 36 1/3 | 39 | 37 1/6 | 38 5/6 |
| 11 | 14 1/6 | 18 | 12 1/3 | 19 5/8 |
| 12 | 27 | 23 1/3 | 26 1/6 | 28 23/48 |
| 13 | 30 | 28 | 26 | 42 1/6 |
| 14 | 32 1/12 | 24 1/3 | 23 1/6 | 33 11/24 |
| 15 | 87 1/6 | 72 1/12 | 71 1/6 | 90 1/3 |
| 16 | 20 | 19 1/6 | 19 1/12 | 21 11/12 |
| 17 | 21 | 19 1/3 | 17 1/6 | 22 1/3 |
| 18 | 29 | 28 | 27 1/6 | 30 1/4 |
| 19 | 22 1/6 | 20 1/3 | 20 | 23 2/3 |
| 20 | 31 5/12 | 28 1/6 | 27 | 35 1/2 |
| 21 | Knit | | | |
| 22 | 32 1/3 | 30 7/12 | 30 | 33 13/24 |
| 23 | 30 | 38 1/2 | 18 5/6 | 50 1/6 |
| 24 | 11 1/12 | 10 1/3 | 9 5/6 | 15 13/24 |
| 25 | 19 | 20 | 19 1/9 | 20 1/3 |
| 26 | 12 1/3 | 13 1/9 | 12 2/9 | 13 7/12 |
| 27 | 15 1/3 | 54 1/3 | 18 | 60 2/3 |
| 28 | 15 1/6 | 50 | 9 1/3 | 53 1/3 |
| 29 | 17 | 17 2/3 | 17 1/9 | 18 1/9 |
| 30 | 58 1/3 | 68 2/3 | 39 1/3 | 69 23/24 |
| 31 | 41 1/6 | 51 8/9 | 39 | 52 1/12 |
| 32 | Knit | | | |
| 33 | Knit | | | |
| 34 | 36 1/3 | 37 1/9 | 37 | 37 5/9 |
| 35 | 12 1/3 | 13 2/3 | 12 1/6 | 13 5/9 |
| 36 | 19 | 20 | 19 2/3 | 20 1/3 |
| 37 | 29 1/6 | 30 | 29 | 30 1/6 |
| 38 | 15 | 16 1/6 | 14 1/2 | 16 5/12 |
| 39 | 8 1/2 | 9 1/2 | 8 | 9 |
| 40 | 11 1/3 | 12 1/6 | 11 3/4 | 12 1/2 |
| 41 | 22 | 22 1/3 | 21 5/6 | 22 1/3 |
| 42 | 32 1/2 | 33 3/4 | 32 1/6 | 33 1/4 |
| 43 | 37 | 38 1/6 | 36 1/3 | 38 1/2 |
| 44 | 20 | 22 1/2 | 15 | 22 5/6 |
| 45 | 38 | 39 1/4 | 37 1/6 | 39 1/6 |
| 46 | 40 | 44 1/2 | 42 | 44 1/12 |
| 47 | 14 1/2 | 15 1/2 | 13 2/3 | 15 1/12 |
| 48 | 15 1/2 | 15 | 14 1/3 | 15 19/24 |
| 49 | 11 | 11 1/3 | 10 1/6 | 11 1/4 |
| 50 | 17 | 18 1/2 | 15 5/6 | 18 1/4 |
| 51 | 23 1/6 | 26 1/6 | 22 | 25 1/3 |
| 52 | 15 1/3 | 18 | 14 1/6 | 18 1/2 |
| 53 | 57 5/6 | 60 2/3 | 56 | 61 5/6 |
| 54 | Knit | | | |
| 55 | 10 | 12 | 9 | 26 1/3 |
| 56 | 27 2/3 | 32 1/3 | 27 | 33 1/3 |
| 57 | 30 1/3 | 38 1/6 | 28 5/6 | 39 |
| 58 | 16 5/6 | 24 | 15 | 23 1/3 |
| 59 | 24 | 19 1/3 | 16 | 27 2/3 |
| 60 | 4 2/3 | 5 | 4 1/6 | 5 1/4 |
| 61 | 23 5/6 | 26 1/6 | 23 1/3 | 25 1/6 |
| 62 | Knit | | | |
| 63 | 28 | 50 | 26 1/2 | 58 1/2 |
| 64 | 29 | 37 1/6 | 27 1/2 | 39 1/6 |
| 65 | 27 | 28 1/2 | 11 | 30 1/2 |
| 66 | 48 | 46 | 45 | 44 |

**Table 12**

ABRASION UNDER KERTEZ METHOD

| No. | Rev. Until Breaking | No. | Rev. Until Breaking |
|---|---|---|---|
| 20 Oz. | | 32 | 714 |
| O. D. Milton | 2030 | 33 | 960 |
| 1 | 381 1/3 | 34 | 1119 |
| 2 | 227 1/3 | 35 | 490 |
| 3 | 703 2/3 | 36 | 112 |
| 4 | 665 | 37 | 322 |
| 5 | 451 1/3 | 38 | 210 |
| 6 | 280 | 39 | 350 |
| 7 | 275 1/3 | 40 | 350 |
| 8 | 238 2/3 | 41 | 385 |
| 9 | 133 1/3 | 42 | 231 |
| 10 | 262 1/3 | 43 | 395 |
| 11 | 402 | 44 | 455 |
| 12 | 50 2/3 | 45 | 406 |
| 13 | 98 | 46 | 497 |
| 14 | 595 1/3 | 47 | 235 |
| 15 | 28 | 48 | 301 |
| 16 | 387 1/3 | 49 | 443 |
| 17 | 43 1/6 | 50 | 245 |
| 18 | 553 | 51 | 83 |
| 19 | 420 | 52 | 148 |
| 20 | 245 | 53 | 289 |
| 21 | 616 | 54 | 285 |
| 22 | 445 | 55 | 190 |
| 23 | Disintegrated in 10% HCL as largely cotton | 56 | 203 |
| | | 57 | 95 |
| | | 58 | 93 |
| 24 | 525 | 59 | 216 |
| 25 | 350 | 60 | 108 |
| 26 | 161 | 61 | 324 |
| 27 | 280 | 62 | 167 |
| 28 | 280 | 63 | 187 |
| 29 | 399 | 64 | 187 |
| 30 | 280 | 65 | 241 |
| 31 | 175 | 66 | 128 |

The average number of drops for the coats below $29.52 is 4.9, while for those above $29.52 is 5.7 drops. Thus among the higher priced coats is found a little more protection against moisture. Number 45 is labeled "Shower proof." Sixty-three drops were required to moisten the blotter beneath it. This is one of the cheaper coats which goes to show that the statement just made does not hold in all cases.

The weathering test was made by exposing the fabric to the action of the weather for thirty days. The time chosen was October 15th to November 13th, inclusive. The first fifty were weathered in 1928 and the last sixteen in 1929. In 1928[7] the rainfall for the thirty days was 1.25 inches, the average relative humidity was 82.03 and the total amount of sunshine was 141 hours and 2 minutes. The extreme of temperature was -|-16° F and -|-62° F. There were twenty-three days when the temperature was down to 32° F or below. In 1929 the rainfall for those thirty days was .78 inches, the average relative humidity was 82.93, and the total amount of sunshine was 149 hours and 38 minutes. The extreme of temperature was -|-21° F and -|-78° F. There were nineteen days when the temperature was 32° F or below. The weather was not very different for the two periods except for rainfall.

[7]From local records.

**Table 13**

DROP TEST

| No. | Drops Necessary to Stain Blotter | No. | Drops Necessary to Stain Blotter |
|---|---|---|---|
| 1 | 1 | 34 | 20.1 |
| 2 | 1 | 35 | 2 |
| 3 | 1 | 36 | 2 |
| 4 | 1.1 | 37 | 5 |
| 5 | 1 | 38 | 3 |
| 6 | 1 | 39 | 6 |
| 7 | 2.1 | 40 | 3 |
| 8 | 2 | 41 | 2 |
| 9 | 1 | 42 | 7 |
| 10 | 1.1 | 43 | 9 |
| 11 | 1 | 44 | 9 |
| 12 | 19.5 | 45 | 63 |
| 13 | 2.2 | 46 | 3 |
| 14 | 7.2 | 47 | 5 |
| 15 | 3.1 | 48 | 4 |
| 16 | 2.4 | 49 | 3.2 |
| 17 | 2 | 50 | 2.5 |
| 18 | 2.6 | 51 | 13 |
| 19 | 2.1 | 52 | 9 |
| 20 | 2.2 | 53 | 8 |
| 21 | 7.3 | 54 | 13 |
| 22 | 5.1 | 55 | 9 |
| 23 | 1 | 56 | 12 |
| 24 | 5.6 | 57 | 6 |
| 25 | 2 | 58 | 7 |
| 26 | 2.2 | 59 | 4 |
| 27 | 2.4 | 60 | 7 |
| 28 | 1 | 61 | 7 |
| 29 | 2 | 62 | 5 |
| 30 | 1.4 | 63 | 5 |
| 31 | 2.3 | 64 | 9 |
| 32 | 3.2 | 65 | 4 |
| 33 | 4.1 | 66 | 6 |

Examinations were made for fastness of color, shrinkage, effect on tensile strength and on friction test.

The color was affected considerably in some cases, while others were not affected very much. Herzfeld's method[8] of naming degrees of fastness is used. Fast, no change on exposing a month to direct

[8]Herzfeld, Dr. J., "Technical Testing of Yarns and Fabrics," London, Scott Greenwood & Sons.

**Table 14**

EFFECT OF WEATHERING ON COLOR OF FABRICS

| Fast | Fairly Fast | Moderately Fast | Fleeting |
|---|---|---|---|
| 8 | 2 | 3 | 1 |
| 13 | 4 | 5 | 10 |
| 15 | 6 | 9 | 29 |
| 16 | 7 | 11 | 32 |
| 20 | 18 | 12 | 34 |
| 23 | 22 | 14 | 58 |
| 24 | 25 | 17 | 62 |
| 26 | 30 | 19 | |
| 27 | 31 | 21 | |
| 36 | 35 | 28 | |
| 37 | 40 | 33 | |
| 39 | 43 | 38 | |
| 41 | 44 | 46 | |
| 42 | 48 | 47 | |
| 45 | 51 | 49 | |
| 52 | 54 | 50 | |
| 61 | 55 | 53 | |
| | 59 | 56 | |
| | 60 | 57 | |
| | 63 | 65 | |
| | 64 | 66 | |

**Table 15**

SHRINKAGE DUE TO WEATHERING

| No. O. D. Type | Warp | | | Filling | | |
|---|---|---|---|---|---|---|
| | Per Cent First Week | Per Cent Second Week | Total For 30 Days | Per Cent First Week | Per Cent Second Week | Total For 30 Days |
| C | 5.21 | 1.5 | 6.71 | 4.79 | 1.4 | 6.19 |
| 1 | 3.59 | 1.19 | 4.78 | 3.93 | 1.57 | 5.50 |
| 2 | 7.82 | 2.23 | 10.05 | 6.89 | 2.06 | 8.95 |
| 3 | 7.30 | 2.24 | 9.54 | 1.38 | .0 | 1.38 |
| 4 | 4.73 | .79 | 5.52 | 1.84 | .89 | 2.23 |
| 5 | 4.73 | 2.36 | 7.09 | 1.04 | 0.0 | 1.04 |
| 6 | 6.42 | 1.33 | 7.74 | 2.60 | 0. | 2.06 |
| 7 | 2.90 | .0 | 2.90 | 3.87 | 0. | 3.87 |
| 8 | 3.27 | .0 | 3.27 | 2.72 | 0. | 2.72 |
| 9 | 5.55 | 1.11 | 6.66 | 5.51 | 0. | 5.51 |
| 10 | 8.5 | 1.58 | 10.18 | 3.5 | 0. | 3.5 |
| 11 | 6.4 | .0 | 6.4 | 4.7 | 0. | 4.7 |
| 12 | 2.42 | 1.3 | 3.72 | 2.28 | .8 | 3.08 |
| 13 | 4.38 | 1.9 | 6.28 | 2.15 | 1.4 | 3.55 |
| 14 | 4.38 | 2.1 | 6.48 | 8.3 | .0 | .83 |
| 15 | 1.61 | .0 | 1.91 | 7.52 | .0 | 7.52 |
| 16 | 4.40 | .8 | 5.2 | 4.16 | .0 | 4.16 |
| 17 | 3.52 | 1.1 | 4.62 | 9.61 | .0 | 9.61 |
| 18 | 4.77 | 2.3 | 7.07 | 2.74 | .0 | 2.74 |
| 19 | 4.21 | .8 | 5.01 | 3.67 | .0 | 3.67 |
| 20 | 4.67 | 1.2 | 5.87 | 5.00 | 1.5 | 6.5 |
| 21 | 1.84 | 2.3 | 414 | 2.04 | .0 | 2.04 |
| 22 | 4.72 | 1.1 | 5.82 | 3.03 | 2.02 | 5.05 |
| 23 | 7.98 | .0 | 7.98 | .90 | .0 | .9 |
| 24 | 3.58 | .0 | 3.58 | 3.62 | .0 | 3.62 |
| 25 | 1.9 | .0 | 2.98 | 2.27 | .0 | 5.45 |
| 26 | 2.18 | .0 | 3.92 | 2.4 | .0 | 4.0 |
| 27 | 3.2 | .0 | 4.6 | 0.0 | 0. | 0. |
| 28 | 4.59 | 0. | 8.99 | 4.2 | 0. | 4.2 |
| 29 | 5.02 | 0. | 7.89 | 4.03 | 0. | 7.65 |
| 30 | 2.04 | 0. | 4.08 | 2.47 | 0. | 2.47 |
| 31 | 2.13 | 0. | 5.33 | .0 | 2. | .0 |
| 32 | 2.89 | 1.03 | 7.63 | .0 | 2. | .0 |
| 33 | 2.79 | 0. | 5.57 | 4.35 | 0. | 4.35 |
| 34 | 1.3 | .04 | 2.46 | .0 | 0. | 1.62 |
| 35 | 4.92 | 0. | 8.13 | 4.66 | 0. | 9.66 |
| 36 | 2.74 | 0. | 3.95 | 2.61 | 0. | 4.06 |
| O. D. Type C | 3.44 | 0. | 6.81 | 2.72 | 0. | 5.73 |
| 37 | 0. | .75 | .75 | 2.57 | 0. | 2.57 |
| 38 | 3.94 | .83 | 4.77 | 5.2 | 0. | 5.2 |
| 39 | 0. | .5 | .5 | .57 | 0. | .57 |
| 40 | 4.08 | .86 | 4.94 | 3.1 | 0. | 3.1 |
| 41 | 1.28 | 0. | 1.28 | 2.67 | 0. | 2.67 |
| 42 | 1.9 | 0. | 1.9 | 0. | 0. | 0. |
| 43 | 1.04 | 1.04 | 2.08 | 1.32 | 0. | 1.32 |
| 44 | 4.08 | 1.72 | 5.8 | 5.0 | 0. | 5.0 |
| 45 | 2.31 | 1.54 | 3.85 | 4.16 | 1.66 | 4.16 |
| 46 | 1.81 | 1.2 | 3.01 | 0. | 1.35 | 1.35 |
| 47 | 1.87 | 1.04 | 2.91 | 2.92 | .97 | 3.89 |
| 48 | 3.42 | 1.71 | 5.13 | 4.72 | 1.57 | 6.29 |
| 49 | 0. | 1.95 | 1.95 | 2.34 | 0. | 2.34 |
| 50 | 3.05 | 1.31 | 4.35 | 5.5 | 1.0 | 6.5 |
| 51 | 1.7 | .8 | 4.4 | 0. | 0. | 2.4 |
| 52 | 3.0 | 1.3 | 4.3 | 0. | 2.1 | 2.1 |
| 53 | 0. | 1.2 | 1.2 | 0. | 0. | 3.6 |
| 54 | 3.2 | .8 | 4.0 | 3.0 | 0. | 3.0 |
| 55 | 2.6 | .8 | 5.5 | 3.7 | 0. | 7.4 |
| 56 | 1.7 | 0. | 1.7 | 4.2 | 0. | 4.2 |
| 57 | 1.2 | 0. | 3.3 | 1.5 | 0. | 1.5 |
| 58 | 1.7 | 0. | 3.6 | 3.5 | 0. | 3.5 |
| 59 | 1.2 | 0. | 3.2 | 1.5 | 0. | 1.5 |
| 60 | 2.9 | 0. | 4.9 | 0. | 0. | 0. |
| 61 | .8 | 0. | 2.8 | 1.6 | 0. | 4.1 |
| 62 | 2.0 | 0. | 3.6 | 3.8 | 0. | 6.5 |
| 63 | 0. | 1.3 | 4.1 | 0. | 0. | 2.5 |
| 64 | 1.2 | 0. | 2.4 | 0. | 0. | 3.1 |
| 65 | 1.2 | 0. | 3.5 | 2.8 | 0. | 2.8 |
| 66 | 1.2 | 0. | 3.0 | 2.6 | 0. | 6.2 |

sunlight; fairly fast, those changing some in a month; moderately fast, those which show some change in fourteen days, and fleeting, those more or less completely faded in the two weeks. The results

**Table 16**

FASTNESS OF COLOR

| No. | Street Dust | Dilute HCL | Oxidation | Dilute Alkali |
|---|---|---|---|---|
| 1 | Not Fast | Not Fast | Not Fast | Not Fast |
| 2 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 3 | Not Fast | Not Fast | Fairly Fast | Not Fast |
| 4 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 5 | Not Fast | Not Fast | Fairly Fast | Not Fast |
| 6 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 7 | Fast | Not Fast | Fairly Fast | Fairly Fast |
| 8 | Fast | Fast | Fast | Fairly Fast |
| 9 | Fast | Fairly Fast | Fairly Fast | Fairly ast |
| 10 | Fairly Fast | Not Fast | Not Fast | Fairly Fast |
| 11 | Fast | Fairly Fast | Fast | Fairly Fast |
| 12 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 13 | Fast | Fast | Fast | Fast |
| 14 | Not Fast | Not Fast | Not Fast | Not Fast |
| 15 | Fast | Fairly Fast | Fast | Fairly Fast |
| 16 | Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 17 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 18 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 19 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 20 | Fairly Fast | Fairly Fast | Fast | Fairly Fast |
| 21 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 22 | Fast | Fairly Fast | Fast | Fairly Fast |
| 23 | Fairly Fast | Fairly Fast | Fast | Fairly Fast |
| 24 | Fast | Fairly Fast | Fast | Fairly Fast |
| 25 | Fast | Fairly Fast | Fast | Fairly Fast |
| 26 | Fast | Fairly Fast | Fast | Fairly Fast |
| 27 | Fast | Fairly Fast | Fast | Fairly Fast |
| 28 | Fast | Fairly Fast | Fast | Fairly Fast |
| 29 | Fast | Fairly Fast | Not Fast | Fairly Fast |
| 30 | Fast | Fairly Fast | Fast | Fairly Fast |
| 31 | Fast | Fairly Fast | Fast | Fairly Fast |
| 32 | Fairly Fast | Not Fast | Fairly Fast | Not Fast |
| 33 | Fairly Fast | Not Fast | Fairly Fast | Not Fast |
| 34 | Fairly Fast | Not Fast | Fairly Fast | Not Fast |
| 35 | Not Fast | Not Fast | Not Fast | Not Fast |
| 36 | Fairly Fast | Fairly Fast | Fairly Fast | Fairly Fast |
| 37 | Fast | Not Fast | Fairly Fast | Fast |
| 38 | Fast | Not Fast | Fast | Fairly Fast |
| 39 | Fairly Fast | Not Fast | Fast | Not Fast |
| 40 | Fast | Not Fast | Fairly Fast | Fairly Fast |
| 41 | Fast | Not Fast | Fairly Fast | Fast |
| 42 | Fast | Not Fast | Not Fast | Not Fast |
| 43 | Fast | Not Fast | Fairly Fast | Fairly Fast |
| 44 | Fast | Not Fast | Fairly Fast | Fast |
| 45 | Fast | Not Fast | Not Fast | Fast |
| 46 | Fast | Not Fast | Fairly Fast | Fairly Fast |
| 47 | Fast | Not Fast | Fairly Fast | Fast |
| 48 | Fast | Not Fast | Fairly Fast | Fast |
| 49 | Fast | Not Fast | Fast | Fast |
| 50 | Fast | Not Fast | Fairly Fast | Fast |
| 51 | Fast | Not Fast | Fairly Fast | Fast |
| 52 | Fast | Fast | Fast | Fast |
| 53 | Fast | Fairly Fast | Fast | Fast |
| 54 | Fast | Not Fast | Fast | Fast |
| 55 | Fast | Not Fast | Not Fast | Fast |
| 56 | Fast | Not Fast | Fairly Fast | Fast |
| 57 | Fast | Not Fast | Fast | Fast |
| 58 | Fast | Not Fast | Fairly Fast | Fast |
| 59 | Fast | Not Fast | Fast | Fast |
| 60 | Not Fast | Not Fast | Fast | Fast |
| 61 | Fast | Fast | Fast | Fast |
| 62 | Fairly Fast | Not Fast | Fairly Fast | Fairly Fast |
| 63 | Fast | Fairly Fast | Fast | Fast |
| 64 | Fast | Not Fast | Fast | Fast |
| 65 | Fairly Fast | Not Fast | Fast | Fast |
| 66 | Not Fast | Not Fast | Fairly Fast | Fast |

are recorded in Table 14. The average of the price of the coats listed under fast is $31.85, while the average of those under fleeting is $25.71. The difference between the two averages is $6.14, which shows that faster colors will probably be found in higher priced garments. On the other hand, the two highest priced garments, namely 19 and 53, come under moderately fast.

The shrinkage upon exposure to the weather for a month varied from 10.18 per cent in length in No. 10 to 0 in width of 27, 31, 32, 42 and 60. The shrinkage for first and second week and total for the thirty days is given in Table 15.

The average amount of shrinkage lengthwise for the coats below the average in price is 5.25 per cent, while for those above is 4.20 per cent. On the width the first group averages 4.55 per cent and the second 2.45 per cent. The average shrinkage is 1.05 per cent less lengthwise and 2.10 per cent less crosswise for the high priced garments, but average price is 109.9 per cent greater.

The color was tested for fastness to street dust, dilute acid, oxidation, dilute alkali, hot pressing and rubbing. The linings were tested for fastness, to perspiration and to rubbing.

Fastness to lime or street dust was tested by the use of the following mixture[9]: 10 grams quicklime, 12 cc of 10 per cent ammonia and a liter of water. The color change is noted in Table 16, column 1.

A few, as 1, 3, 5, 10, 14, 35, 60 and 66, showed decided spots while many showed no color change. Numbers 3 and 14 cost more than the average, while the other six cost less than the average. Sixty-three per cent of the high priced garments and 61 per cent of the cheaper garments are fast to this mixture.

Fastness to dilute acid was tested by the use of a 40 per cent solution of hydrochloric acid, U. S. P. A piece of each garment was placed in the dilute acid for four minutes. Four were fast. Of these three are from the coats that cost less than the average price Of the high priced garments 51.8 per cent were not fast and 3.7 per cent were fast. Among those below the average in cost 56.4 per cent were not fast and 7.6 per cent were fast to dilute acid.

To test for fastness to oxidation, pieces of the fabric were soaked for 10 hours in 10 parts water and two parts hydrogen peroxide (10 volume strength). The results are given in Table 16, column 3. Of those below the average price 15 per cent are not fast and 7 per cent of the high priced coats are not fast. Forty-three per cent of the low priced garments and 37 per cent of the high priced garments are fast.

To test for fastness to dilute alkali 10 per cent ammonia was used. This is the strength of "Household Ammonia." Each piece was soaked for four minutes. The results are given in column four of Table 16. Forty-three and five-tenths per cent of the low priced garments and 25.9 per cent of the high priced were fast. Of those not fast 10.2 per cent of the low priced garments showed a decided change, while 22.2 per cent of the high priced were not fast.

[9]Herzfeld, Dr. J., "Technical Testing of Yarns and Fabrics," London, Scott Greenwood & Sons.

Hot pressing did not affect the color of the fabric or the dampened pressing cloth.

Rubbing with a moist white cloth did not color the cloth in any case.

## Linings

The linings vary greatly in quality. Six have cotton linings and two are of cotton and rayon mixture. Fifty-eight have silk or part silk linings. While cotton tests better for the price, silk is usually preferred for lining women's coats. The following tests were made, namely: the number of picks and ends, tensile strength, abrasion, fastness of dye to perspiration and to rubbing and the percentage of cotton, dye, filler and silk.

The number of picks and ends is given in Table 17. In comparing the lining of the ten highest priced coats with the ten cheapest coats we find the average number of picks in the first ten is 89-|-, while in the cheapest ten is 73-|- per inch. The average number of ends in the best ten is 144-|-, while in the ten lowest price is 123-|-. Thus it appears that the fineness of the lining varies with the price of the coat. This is not true of many of the individual coats. For instance, No. 2 which is the cheapest garment of those examined, has 60 picks, while number 9, which costs almost three times as much, also has 60. The two highest priced coats, 19 and 53, have only 80 picks per inch, while the coat having the highest number of picks (160) costs only $19.75. If we compare the number of ends per inch we find somewhat the same in-

**Table 17**

LININGS—PICK AND ENDS PER INCH

| No. | Picks | Ends | No. | Picks | Ends |
|---|---|---|---|---|---|
| 1 | 76 | 140 | 34 | 144 | 53 2/3 |
| 2 | 60 | 100 | 35 | 160 2/3 | 79 |
| 3 | 76 | 128 | 36 | 139 2/3 | 80 2/3 |
| 4 | 72 | 180 | 37 | 76 | 92 |
| 5 | 72 | 128 | 38 | 84 | 184 |
| 6 | 112 | 152 | 39 | 95 | 128 |
| 7 | 124 | 220 | 40 | 92 | 128 |
| 8 | 76 | 132 | 41 | 64 | 140 |
| 9 | 60 | 128 | 42 | 62 | 176 |
| 10 | 60 | 128 | 43 | 72 | 128 |
| 11 | 110 | 150 | 44 | 80 | 114 |
| 12 | 76 | 152 | 45 | 80 | 99 |
| 13 | 84 | 208 | 46 | 80 | 72 |
| 14 | 56 | 216 | 47 | 84 | 140 |
| 15 | 76 | 152 | 48 | 81 | 93 |
| 16 | 76 | 172 | 49 | 76 | 96 |
| 17 | 76 | 160 | 50 | 84 | 68 |
| 18 | 76 | 132 | 51 | 72 | 134 |
| 19 | 80 | 128 | 52 | 84 | 152 |
| 20 | 80 | 132 | 53 | 80 | 152 |
| 21 | 72 | 128 | 54 | 84 | 172 |
| 22 | 80 | 144 | 55 | 76 | 220 |
| 23 | 68 | 136 | 56 | 84 | 124 |
| 24 | 72 | 176 | 57 | 80 | 160 |
| 25 | 74 | 200 | 58 | 76 | 168 |
| 26 | 84 | 258 | 59 | 76 | 180 |
| 27 | 82 | 130 | 60 | 92 | 144 |
| 28 | 44 | 65 | 61 | 80 | 160 |
| 29 | 70 | 119 | 62 | 80 | 192 |
| 30 | 78 | 220 | 63 | 96 | 168 |
| 31 | 79 | 203 | 64 | 88 | 140 |
| 32 | 98 | 198 | 65 | 76 | 208 |
| 33 | 84 | 126 | 66 | 76 | 56 |

consistencies. Thus, if you wish a fine coat lining you cannot judge by the price alone, though your chances are better in a high priced garment.

The tensile strength of the linings was found by taking the average of six tests lengthwise. The results are given in Table 18. In comparing the tensile strength of the ten cheapest coats with the ten best, the former has an average of 27-|- pounds per inch, while the latter shows an average of 35-|-. A better lining will probably be found in a higher priced garment. The highest tensile strength is found in 43. The price of this coat is $29.75, which is approximately the average of the group. The lining with the lowest tensile strength is No. 57, which gives only nine pounds per inch. This coat cost $19.75. This is among the cheaper coats. While the average of the higher priced coats is higher, the price alone does not necessarily determine the strength of the lining.

**Table 18**

TENSILE STRENGTH AND ABRASION TESTS OF LININGS

| No. | Tensile Strength | Revolutions | No. | Tensile Strength | Revolutions |
|---|---|---|---|---|---|
| 1 | 22 1/8 | 336 | 34 | 61 3/4 | 959 |
| 2 | 44 1/3 | 427 | 35 | 42 1/3 | 238 |
| 3 | 29 1/6 | 526 | 36 | 52 5/6 | 616 |
| 4 | 37 2/3 | 462 | 37 | 19 1/2 | 426 |
| 5 | 26 5/6 | 140 | 38 | 57 1/2 | 841 |
| 6 | 45 | 483 | 39 | 27 | 423 |
| 7 | 46 1/3 | 631 | 40 | 28 1/4 | 417 |
| 8 | 29 5/6 | 168 | 41 | 22 1/3 | 351 |
| 9 | 21 1/6 | 103 | 42 | 43 1/4 | 401 |
| 10 | 20 1/3 | 105 | 43 | 83 1/2 | 897 |
| 11 | 45 | 431 | 44 | 12 | 246 |
| 12 | 46 1/6 | 494 | 45 | 21 | 136 |
| 13 | 21 | 273 | 46 | 82 1/4 | 920 |
| 14 | 33 1/6 | 147 | 47 | 21 1/2 | 257 |
| 15 | 12 | 343 | 48 | 24 1/4 | 331 |
| 16 | 19 1/2 | 602 | 49 | 30 1/8 | 411 |
| 17 | 25 | 217 | 50 | 20 | 273 |
| 18 | 36 1/3 | 287 | 51 | 43 1/3 | 55 |
| 19 | 39 5/6 | 532 | 52 | 6 1/2 | 21 |
| 20 | 12 1/3 | 364 | 53 | 32 | 37 |
| 21 | 32 5/6 | 623 | 54 | 37 2/3 | 65 |
| 22 | 12 | 364 | 55 | 27 1/2 | 67 |
| 23 | 41 1/3 | 518 | 56 | 10 1/3 | 54 |
| 24 | 39 1/6 | 537 | 57 | 9 | 30 |
| 25 | 27 1/9 | 469 | 58 | 34 1/3 | 55 |
| 26 | 31 1/2 | 434 | 59 | 10 1/3 | 47 |
| 27 | 30 3/4 | 553 | 60 | 41 1/3 | 78 |
| 28 | 19 1/2 | 84 | 61 | 64 1/3 | 45 |
| 29 | 29 5/6 | 98 | 62 | 23 2/3 | 33 |
| 30 | 25 | 364 | 63 | 36 2/3 | 63 |
| 31 | 21 3/4 | 434 | 64 | 33 1/4 | 28 |
| 32 | 35 5/6 | 406 | 65 | 26 2/3 | 30 |
| 33 | 43 | 315 | 66 | 35 | 31 |

The abrasion test was made in the same manner as in testing the coat fabrics The number of rubbings necessary to break a strip 5 cm. wide was found. The average of three such tests is recorded in Table 18. The five coats that give the highest abrasion test for the linings are 34, 36, 38, 43 and 46. The average price of these five is $32.96. The average price of the five lowest is $26.33. The last sixteen were tested on a different abrasion tester. Therefore, they may be considered separately. In this group approximately the same relation holds true. The average price of the five that test

the highest is $37.05, while the average price of the five lowest in abrasion test is $20.17.

The dye was tested for fastness to perspiration by two different formulas[10]: "Steep samples for five minute periods in a solution of 50 gms. acetic acid and 100 gms. sodium chloride per liter. Dry after each immersion and examine." This was done five times with each sample. Each piece was rubbed with a white cloth. No. 15 rubbed off very slightly. The others were fast to this formula.

The second test used was "5 tablespoons salt, 10 tablespoons vinegar and 1 pint of water. Immerse 15 minutes, dry, repeat and dry again." None of the samples changed in color. No. 15 rubbed off slightly on the white cloth. While the color of the linings did not change the texture was affected by these tests.

Table 19 gives the type of linings and the type of fibre in warp and filling. Among the high priced coats 21 out of the 27 have silk both ways, while in the thirty-nine low priced coats fourteen have silk both ways. A glance at the table will show the distribution of the cotton and silk of the other coats.

**Table 19**
FABRICS IN THE LININGS

| No. | Fabric | Warp | Filling | No. | Fabric | Warp | Filling |
|---|---|---|---|---|---|---|---|
| 1 | Satin | Silk | Cotton | 36 | Crepe | Silk | Silk |
| 2 | Sateen | Cotton | Cotton | 37 | Twill | Silk | Cotton |
| 3 | Crepe | Silk | Silk | 38 | Satin | Silk | Silk |
| 4 | Satin | Silk | Cotton | 39 | Satin | Silk | Silk |
| 5 | Crepe | Silk | Silk | 40 | Satin | Silk | Silk |
| 6 | Sateen | Cotton | Cotton | 41 | Twill | Silk | Cotton |
| 7 | Satin | Silk | Silk | 42 | Crepe | Silk | Silk |
| 8 | Crepe | Silk | Silk | 43 | Crepe | Silk | Silk |
| 9 | Crepe | Silk | Silk | 44 | Satin | Silk | Cotton |
| 10 | Crepe | Silk | Silk | 45 | Twill | Silk | Cotton |
| 11 | Sateen | Cotton | Cotton | 46 | Satin | Rayon | Cotton |
| 12 | Sateen | Cotton | Cotton | 47 | Satin | Silk | Silk |
| 13 | Satin | Silk | Silk | 48 | Satin | Silk | Cotton |
| 14 | Brocade | Silk | Cotton | 49 | Satin | Silk | Cotton |
| 15 | Satin | Silk | Cotton | 50 | Sateen | Cotton | Cotton |
| 16 | Twill | Silk | Cotton | 51 | Crepe | Silk | Cotton |
| 17 | Satin | Silk | Cotton | 52 | Satin | Silk | Cotton |
| 18 | Crepe | Silk | Silk | 53 | Crepe | Silk | Cotton |
| 19 | Crepe | Silk | Silk | 54 | Satin | Silk | Silk |
| 20 | Satin | Silk | Cotton | 55 | Satin | Silk | Cotton |
| 21 | Crepe | Silk | Silk | 56 | Crepe Back Satin | Silk | Silk |
| 22 | Satin | Silk | Cotton | | | | |
| 23 | Sateen | Cotton | Cotton | 57 | Satin | Silk | Cotton |
| 24 | Crepe | Silk | Silk | 58 | Crepe | Silk | Silk |
| 25 | Satin | Silk | Silk | 59 | Satin | Silk | Cotton |
| 26 | Satin | Silk | Silk | 60 | Satin | Silk | Cotton |
| 27 | Crepe | Silk | Silk | 61 | Satin | Silk | Cotton |
| 28 | Jacquard | Cotton | Rayon | 62 | Satin | Silk | Silk |
| 29 | Crepe | Silk | Silk | 63 | Crepe Back Satin | Silk | Silk |
| 30 | Satin | S | Silk | | | | |
| 31 | Satin | Silk | Silk | 64 | Crepe | Silk | Silk |
| 32 | Satin | Silk | Silk | 65 | Satin | Silk | Cotton |
| 33 | Crepe | Silk | Silk | 66 | Fancy Twill | Cotton | Synthetic Fibre |
| 34 | Sateen | Cotton | Cotton | | | | |
| 35 | Crepe | Silk | Silk | | | | |

The chemical analysis of the coat linings was done by the experimental chemist in the chemistry department. The approximate per cent of moisture, dye and filler, silk, cotton and synthetic fibre is given in Table 20.

[10]Woolman & McGowan, "Textiles," New York, Macmillan Company, 1926.

**Table 20**
CHEMICAL ANALYSIS OF COAT LININGS

| No. | Moisture | Dye and Filler | Silk | Cotton |
|---|---|---|---|---|
| 1 | 4.79 | 2.73 | 20.55 | 71.93 |
| 2 | 3.85 | 1.76 | | 94.39 |
| 3 | 6.30 | 1.20 | 92.50 | |
| 4 | 4.60 | 6.14 | 11.50 | 77.76 |
| 5 | 6.96 | 1.93 | 91.11 | |
| 6 | 4.12 | 3.58 | 92.30 | |
| 7 | 7.58 | 3.30 | 89.12 | |
| 8 | 17.65 | Trace | 82.35 | |
| 9 | 8.11 | 27.92 | 63.97 | |
| 10 | 8.98 | 23.65 | 67.37 | |
| 11 | 4.11 | 3.57 | | 92.32 |
| 12 | 3.87 | 1.71 | | 94.42 |
| 13 | 8.30 | 32.85 | 59.85 | |
| 14 | 4.60 | 1.97 | 12.25 | 81.18 |
| 15 | 4.85 | 5.27 | 11.42 | 78.46 |
| 16 | 4.46 | 1.38 | 9.83 | 84.33 |
| 17 | 4.93 | 3.20 | 20.25 | 71.62 |
| 18 | 8.10 | 8.50 | 83.4 | |
| 19 | 8.00 | 17.13 | 74.87 | |
| 20 | 4.91 | 5.33 | 12.50 | 77.26 |
| 21 | 7.51 | 15.55 | 76.94 | |
| 22 | 4.92 | 6.61 | 11.30 | 77.17 |
| 23 | 4.25 | 4.57 | | 92.32 |
| 24 | 8.00 | 15.23 | 76.77 | |
| 25 | 6.38 | 6.46 | 87.16 | 0.00 |
| 26 | 6.50 | 13.17 | 80.33 | 0.00 |
| 27 | 6.52 | 7.48 | 86.00 | 0.00 |
| 28 | 7.35 | 1.82 | 51.53 | 39.30 |
| 29 | 6.54 | 18.24 | 75.22 | 0.00 |
| 30 | 6.32 | 9.42 | 84.26 | 0.00 |
| 31 | 6.50 | 8.71 | 84.79 | 0.00 |
| 32 | 7.00 | 37.15 | 55.85 | 0.00 |
| 33 | 6.69 | 15.05 | 78.26 | 0.00 |
| 34 | 5.51 | 2.35 | 92.14 | 0.00 |
| 35 | 7.30 | 30.30 | 62.40 | 0.00 |
| 36 | 7.86 | 10.71 | 76.47 | 4.96 |
| 37 | 6.03 | 3.69 | 9.00 | 81.28 |
| 38 | 7.89 | 16.36 | 75.75 | 0.00 |
| 39 | 7.10 | 16.07 | 76.83 | 0.00 |
| 40 | 7.15 | 20.62 | 72.23 | 0.00 |
| 41 | 5.48 | 11.17 | 0.00 | 81.08 |
| 42 | 6.79 | 22.13 | 71.08 | 0.00 |
| 43 | 7.48 | 18.54 | 73.98 | 0.00 |
| 44 | 4.78 | 12.73 | 0.00 | 82.90 |
| 45 | 4.40 | 4.31 | 8.88 | 82.41 |
| 46 | 6.74 | 4.39 | 52.68* | 36.48 |
| 47 | 5.77 | 12.06 | 82.17 | 0.00 |
| 48 | 4.89 | 7.00 | 15.00 | 73.11 |
| 49 | 4.94 | 4.91 | 15.97 | 74.18 |
| 50 | 5.85 | 3.64 | 0.00 | 91.56 |
| 51 | 3.57 | 14.71 | 34.97 | 46.75 |
| 52 | 3.92 | 12.81 | 11.78 | 71.49 |
| 53 | 7.73 | 18.54 | 36.22 | 37.51 |
| 54 | 4.64 | 11.45 | 83.91 | 0.00 |
| 55 | 3.86 | 6.36 | 20.84 | 68.94 |
| 56 | 6.18 | 23.44 | 70.38 | 0.00 |
| 57 | 3.82 | 12.55 | 11.49 | 72.14 |
| 58 | 6.56 | 18.82 | 74.62 | 0.00 |
| 59 | 3.65 | 10.91 | 11.40 | 74.04 |
| 60 | 5.94 | 20.05 | 35.03 | 38.98 |
| 61 | 4.34 | 19.54 | 18.22 | 57.90 |
| 62 | 5.01 | 16.70 | 78.29 | 0.00 |
| 63 | 6.34 | 18.35 | 75.31 | 0.00 |
| 64 | 4.65 | 18.20 | 77.15 | 0.00 |
| 65 | 3.32 | 2.59 | 20.67* | 73.42 |
| 66 | 4.40 | 12.44 | 15.36 | 77.80 |

*Rayon

For the twenty-seven of the high priced group the average amount of silk is 64.52 per cent; of cotton, 16.42 per cent; of filler and dye 13.31 per cent. The thirty-nine low priced coats have an

average of 35.65 per cent silk, 46.56 per cent cotton and 10.03 per cent filler and dye.

There are many minor things that affect the cost and quality of a garment, as the use of stay tape, type of thread, kind of buttonholes and type of tailoring. Table 21 gives a list of these findings.

**Table 21**

MINOR DETAILS OF GARMENTS

| No. | Stay Tape | Lining Sewed In By | Buttonhole | Seam Stitching |
|---|---|---|---|---|
| 1 | None | Machine | Bound | Cotton |
| 2 | Cotton | Machine | Loop | Cotton |
| 3 | Cotton | Machine Except Bottom | Loop | Cotton |
| 4 | None | Machine Except Bottom | Bound | Cotton |
| 5 | None | Machine Except Bottom | Loop | Cotton |
| 6 | Cotton | Machine | Bound | Cotton |
| 7 | Linen | Hand | Tailored (hand) | Silk |
| 8 | Cotton | Machine Except Bottom | Bound | Cotton |
| 9 | Cotton | Machine Except Bottom | Loop | Cotton |
| 10 | Cotton | Machine Except Bottom | Bound | Cotton |
| 11 | Cotton | Machine | Loop | Cotton |
| 12 | Cotton | Facing and Bottom by Hand | Tailored Machine | Cotton |
| 13 | Cotton | Machine | Loop | Cotton |
| 14 | Cotton | Machine | Loop | Cotton |
| 15 | None | Machine | Loop | Cotton |
| 16 | None | Machine | Loop | Cotton |
| 17 | Cotton | Machine | Bound | Cotton |
| 18 | None | Machine | Loop | Cotton |
| 19 | None | Machine | Loop | Cotton |
| 20 | Cotton | Machine | Bound | Cotton |
| 21 | Cotton | Machine | Bound | Cotton |
| 22 | Cotton | Machine | Bound | Cotton |
| 23 | Cotton | Machine | Bound | Cotton |
| 24 | Cotton | Machine Except Facing and Bottom | Loop | Cotton |
| 25 | Cotton | Bottom Hemmed by Hand; Rest by Machine | Bound | Cotton |
| 26 | Cotton | Bottom Hemmed by Hand; Rest by Machine | Bound | Cotton |
| 27 | Cotton | Lining Hemmed In With Stitched Hem at Bottom | Loop | Cotton |
| 28 | Cotton | Stitched | Loop | Cotton |
| 29 | Cotton | Stitched Except Bottom | Bound | Cotton |
| 30 | Cotton | Bottom Only Hemmed Down | Loop | Cotton |
| 31 | None | Lining Hemmed In | Loop | Cotton |
| 32 | Cotton | Machine | Bound | Cotton |
| 33 | Cotton | Lining Hemmed In | Bound | Cotton |
| 34 | Cotton | Lining Hemmed In | Bound | Cotton |
| 35 | None | Machine Except Bottom | Bound | Cotton |
| 36 | None | Lining Sewed In by Hand | Loop | Cotton |
| 37 | Cotton | Stitched | Machine | Mercerized Cotton |
| 38 | Cotton | Machine | Loop | Mercerized Cotton |
| 39 | Cotton | Machine | Loop | Mercerized Cotton |
| 40 | None | Machine | Loop | Mercerized Cotton |
| 41 | Cotton | Machine | Bound | Cotton |

**Table 21—Continued**

MINOR DETAILS OF GARMENTS

| No. | Stay Tape | Lining Sewed In By | Buttonhole | Seam Stitching |
|---|---|---|---|---|
| 42 | Cotton | Machine | Loop | Cotton |
| 43 | Cotton | Stitched | Machine | Cotton |
| 44 | Cotton | Stitched | Bound | Cotton |
| 45 | Cotton | Stitched | Machine | Cotton |
| 46 | Cotton | Machine Stitched | Loop | Cotton |
| 47 | Cotton | Machine Stitched | Bound | Cotton |
| 48 | Cotton | Machine Stitched | Loop | Cotton |
| 49 | Cotton | Stitched | Loop | Cotton |
| 50 | Cotton | Stitched | Loop | Cotton |
| 51 | Cotton | By Hand | Loop | Cotton |
| 52 | Cotton | Machine | Loop | Cotton |
| 53 | Cotton | Hand | Bound | Cotton |
| 54 | Cotton | Hand | Bound | Cotton |
| 55 | Cotton | Machine | Loop | Cotton |
| 56 | Cotton | Machine | Loop | Cotton |
| 57 | Cotton | Machine | Loop | Cotton |
| 58 | Cotton | Hand | Loop | Cotton |
| 59 | Cotton | Machine | Loop | Cotton |
| 60 | Cotton | Machine | Loop | Cotton |
| 61 | Cotton | Machine Stitched | Loop | Cotton |
| 62 | Cotton | Machine Stitched | Loop | Cotton |
| 63 | Cotton | Hand | Loop | Cotton |
| 64 | Cotton | Machine | Bound | Cotton |
| 65 | Cotton | Machine | Machine Worked | Cotton |
| 66 | Cotton | Machine | Machine Worked | Cotton |

The best stay tape used in these garments is linen. One, namely No. 7, had linen and eleven coats had none. In 54 of the garments cotton stay tapes were used. The buttonholes also vary in cost of construction. The most expensive type is the hand tailored as in No. 7. Except for the severely tailored garments the type of buttonhole is largely a matter of style. A good grade of silk thread is most desirable since the seams are less likely to rip. The method of putting in the lining may affect the cost of the garment. In the better grades of tailored garments the lining is put in by hand, while in cheaper ones machine stitching is used.

## Conclusion

The number of coats examined is too small to draw general conclusions but some may be made for the group. The high priced garments tested higher on the average in every case except in some of the tests for fastness of color. The per cent of advantage was small in proportion to the increase in price. Many of the high priced coats tested low in one or more of their properties.

The consumer should know definitely what she wishes in a garment, whether it be style, workmanship or perfection of fabric. Perhaps all three are desired. The careful buyer will then look for these properties and be willing to pay a fair price for them. Under quality of fabric what is desired? Is it fineness, softness, firmness, strength, weight or shower proofing? Naturally this depends on the use for which the garment is bought. The individual consumer cannot give laboratory tests to aid in her decision, but much can be learned through thoughtful examination.