A study of the selection, care and wearing qualities of silk hosiery
by Vivian Baker

A thesis Submitted to the Graduate Committee in partial fulfillment of the requirements for the Degree of MASTER OF SCIENCE IN HOME ECONOMICS
Montana State University

Abstract:
Information gathered from the fifteen stores that sold women'S silk hosiery, showed that in all thirty-four different brands were carried and from one to five kinds within a brand might be purchased.

The prices ranged from thirty cents to five dollars per pair. The sales-people thought their customers were influenced most by price and color, but the majority of women also considered weight, smoothness, evenness of weave, shape and the placing of reinforcements. They reported that interest was shown in the materials used, the women preferring silk to rayon in the leg of hosiery, but divided in their preference for silk or cotton hems. Half of the stores believed that a silk foot was most popular, while the other half thought little attention was paid to materials used in the feet. They thought most women asked about wearing qualities of hose and that this influenced their selection. It was interesting to note that the sales-people stated that women were buying hose in the longest lengths of leg.

Personal interviews with a large number of women in the community furnished some valuable information about their methods of Selecting hosiery, their ways of caring for hosiery and their opinions about its wearing quality. Two hundred and fifty women were interviewed, the group consisting of 54 students, 25 clerks and stenographers, 28 teachers, 100 town homemakers and 42 rural homemakers. In Table I, it will be seen that these women were forty-seven brands of silk and rayon hosiery. The trade-marked, names of these brands are not included in this Study but they will be disignated by Roman numerals. The number of women wearing the Various weights in these brands, and the price paid per pair are also shown in Table I.

f * i I

A STUDY OF THE SELECTION, CARE AND WEARING QUALITIES OF SILK HOSIERY

BY

VIVIAN BAKER

A Thesis Submitted to the Graduate Committee
in partial fulfillment of the requirements
for the Degree of

MASTER OF SCIENCE
IN
HOME ECONOMICS

June, 1931

Approved:

s- Jessie E. Richardson
In charge of Major Work

s- Gladys Branegan
Chairman Examing Committee

s- R. E. Kirk
Chairman Graduate Committee

TABLE OF CONTENTS

PAGING DIFFERS FROM ORIGINAL

A STUDY OF THE SELECTION, CARE AND WEARING QUALITIES OF SILK HOSIERY.

INTRODUCTION

Silk hosiery is a very important item in the clothing purchases of today. Women have come to wear it more generally than cotton hosiery, for it has a more pleasing appearance, is more suitable to accompany the modern wardrobe, is more comfortable, and comes in a greater variety of colors. While its use brings great satisfaction, silk hosiery is, however, considered a rather expensive article of clothing, for the reason that the money spent for it does not seem to be compensated by the amount of wear received.

Very little is definitely known about the causes of the short life of silk hosiery. Whether it is due to various types of construction, composition, or to a lack of available information about the selection of hosiery, or to improper care in handling and laundering them, remains to be determined.

HISTORY

Women recognize the fact that there are many brands of silk hosiery from which to choose. To the average consumer, price is ordinarily thought to be the distinguishing mark of quality, and yet, a knowledge of construction is even more important. Very few seem to realize that a number of types may usually be found within a brand, and that each type has a different kind of construction.

The two extreme types of construction os silk hose are known as service weight and chiffon, with varying graduations between them. Service weight usually consists of a cotton welt or hem; a cotton foot; a high splice (the reinforcement above the heel) of silk plated with cotton; and a boot (or leg) made of heavy silk yarn. Chiffon weight has a silk hem; a silk foot and high splice; and the boot is made of a silk yarn of smaller diameter.

In addition to these, there are other points of construction that may vary, one of which is shape. Hose are made either full-fashioned or tubular. The former is knit in a flat piece with the leg and heel knit on one machine and the foot on another. The shaping is done by the dropping out of needles. Wherever these occur, marks appear in the knitting known as "fashion-marks". These are found in the back of the boot near the seam, sometimes near the welt, and in the heel and sole. The number and placing of these fashion-marks determine how well the hose will fit. Tubular hose are knit in one operation on a circular machine. They are shaped by cutting out sections from the tubular material.

One of the most important items in construction is the reinforcing of silk hosiery. Reinforcements differ in kind, amount, and placing. They may be of either silk or cotton and of a yarn of varying weights. Usually the high splice reinforcement is of silk or a very fine cotton yarn. The heel reinforcement is heavier; the sole, light weight; and the toe, light weight, except for a rectangular piece that is sometimes found over the center of the toe. This piece varies in weight in different types of hose. The space between the toe and sole reinforcements is taken care of in several ways. In the cradle

foot, the toe reinforcement slopes gradually to the sole, while in others, one or more rectangular reinforcements are placed there. These are supposed to protect the hose at points receiving hard wear but are not always correctly placed. A knowledge of types and placing of reinforcements is very essential in choosing hosiery which will give a desired amount of wear.

The twist of the yarn used in making hose is another significant point in construction. There is a question as to what amount of twist in the yarn will give the greatest satisfaction and wear. There are also different kinds of twists used for hosiery yarns. One recently adopted is called "dull twist", "grenadine" or "grenine" and is made by the twisting together of two yarns each of which has been previously twisted in opposite directions. This makes a more sheer appearance and is said to give more wear.

The gauge number may also vary in construction. "Gauge" refers to the number of needles per inch in the knitting bar, for instance, a 45-gauge machine has 30 needles per inch. The more needles, or the higher the gauge number, the finer will be the weave and more fabric will be included in the width of the leg. The gauge number may be determined by counting the length-wise ridges or wales on the right side of the knit material in an inch and one-half space crosswise. The number of courses per inch also seems to be an important factor in the knitting of hosiery. By "course" is meant the number of cross-wise loops counted lengthwise.

Hosiery differs in composition of yarn as well as in construction. It may be made from reeled silk (that which comes from and unbroken cocoon) or from spun silk (short broken fibers of vary-

ing diameters, taken from imperfect cocoons and spun together). A combination of fibers, such as rayon and silk, may also be used in hosiery yarns.

There are a number of methods employed in the preparation of hosiery for market, which make it difficult for the purchaser to distinguish a desirable article. One of these is boarding, which is a process of stretching the finished hose over a shaped board and steaming them. This is done to give the hose a neat appearance. However, if the board is narrow, the hose will measure longer than those stretched on a wide board. This necessitates that the purchaser shall compare the length and width in order to secure the size she desires. Also, she cannot be sure that the length of foot designated by the size number is the same in all brands without experimenting with them, as manufacturers have not yet established standard practices.

Sometimes it is even difficult to distinguish circular knit hosiery from the full-fashioned type because of mock seams and fashion marks.

Not only are construction and composition important factors to be considered in estimating the length of life of a pair of hose, but the method used in handling and laundering them is said to have an influence on the amount of wear received. Selling agencies, laundries, and clothing experts advocate special care in laundering silk hosiery. It is believed to last longer if it is laundered after each wearing with a mild soap and tepid water. Perspiration is probably harmful to silk hosiery if allowed to remain in it as it permits bacterial action that deteriorates the fibers. Also, in laundering, rubbing

and wringing weaken the silk yarn by placing too great a strain upon it. A suction motion of forcing water through the fibers is thought to be a better method of laundering silk hose. Since alkalies are harmful to animal fibers, a mild soap is suggested as a cleansing agent. Thorough rinsing is also necessary, followed by squeezing the fabric as dry as possible.

In all these considerations of silk hosiery, the manufacturer and consumer have shown especial interest in the appearance of the hosiery. Their construction and composition have been changed from time to time to meet the demands of fashion, but parallel with these, very little definite information has been given to the consumer regarding their durability. Rosamond Cook (1), of the University of Cincinnati, has made a study of hosiery advertising in which it is seen that out of the twenty-five hosiery advertisements selected, eighteen mentioned that the hose were made of silk; nine told that hosiery was full-fashioned; five described reinforcements (placing, not kind); three mentioned picot edge; two mentioned gauge but did not explain its meaning; one gave width of hem; and only three mentioned wearing qualities without naming the factor which made for service.

A few limited studies have been carried on with actual wearing tests in an attempt to find out the relative durability of different brands of hose. In an unpublished report of research conducted at Iowa State College, Grace Trumbo(2) compared the wearing qualities of silk and rayon hosiery. Nine brands were worn by members of the student body and faculty for a period of nine months, but the number of pairs of each brand was not stated. The wear and laundering were kept as uniform as possible, with the hose being rinsed after each

wearing and washed after three wearings, but the actual laundering process was performed by each individual. The condition of the hose was reported only once a month instead of after each wearing. The amount of experimentation done on wear did not seem to justify the conclusions drawn. However, the laboratory tests were very complete including: measurements, weights, thread count, yarn count, twist of yarn, crimp, bursting strength, and tests for the identification of silk and different types of rayon.

Another such study(3) was made on the wearing qualities of silk hosiery at the University of Chicago by Ruth Holmes for her Master's thesis, but is as yet unpublished.

The Dexdale Hosiery Company (4) thought it desirable to compare the wearing qualities of their "sealed" hosiery with "unsealed" hosiery by conducting an "on-the-foot" wearing test. One hundred girls at Wellesley College and one hundred at Radcliffe College were given three stockings apiece - one Dexdale "sealed" stocking and two "unsealed" ones. The "sealed" stocking was worn on one foot and an "unsealed" stocking on the other foot. The student wore these day after day, laundering them each night, and recording the number of hours each stocking was worn per day. The test continued until either the "sealed" stocking or both the "unsealed" stockings were worn out. However, with as little wear as even a hole in the toe, the stocking was discarded. This does not seem a practical estimate of the length of life of hose for the majority of women. Also this test was of a commercial nature rather than of an analytical type. The only laboratory

test made was of the tensile strength of the yarn.

Due to the uncertainty in the amount of wear which can be expected from silk hosiery, it is considered a rather expensive article in a woman's wardrobe. A study made of the clothing expenditures of college girls at Iowa State College (5), showed the amount spent for hose by those who had an average allowance for clothing of $280.13, to be $19.80 or 7.07%. The average of the ten lowest allowances for clothing was $57.49 of which 20.06%, or $11.65, was spent for hose. On this allowance, relatively more was spent for hose than for coats and dresses combined. Not only is hosiery an expensive article in a college girl's wardrobe, but women in general feel that it occupies too large a place in the clothing budget.

Thus it will be seen, that with all the existing brands of silk hosiery and the weights found in each brand, accompanied by their various types of construction and compostion, it is extremely difficult for the consumer to be discriminating in her purchase. Unfortunately, cost does not seem to indicate quality in silk hosiery. For the same price, one may get hosiery of different gauge numbers, different amounts and kinds of reinforcement, different qualities of silk and dyes. When it is further recalled that practidally no definite information, based on laboratory studies, is available about the care and relative wearing qualities of silk hose, a need for study along these lines is apparent, particularly in view of the fact that hosiery demands a large place in a woman's clothing budget.

EXPERIMENTAL PROCEDURE

Before starting the laboratory experiments to determine the construction, composition and wearing qualities of silk hosiery, it seemed advisable to consult with merchants, sales-people and consumers to find what brands were available in the community studied, and the general opinions about them.

Accordingly, the stores selling women's silk hosiery were visited and the manager or sales person interviewed. They were asked for the names of all brands of silk and rayon hose carried in stock, the weights and types of hose included in each brand and their selling prices. Inquiry was made as to the most popular style of hose sold by them, and the best wearing hose. Questions were also asked about the qualities of hose in which women seemed most interested.

Next, an attempt was made to interview as many women as possible and learn what brands of silk hosiery they purchased and the prices usually paid. They were asked to state what factors influenced their selection. In addition, they were questioned in detail about their methods of caring for silk hosiery, including laundering and drying. This was followed by questions, asking for the estimated number of pairs purchased per year, the places in the hose where wear first appeared, and the size of hose and shoes worn.

From the information thus obtained, it was decided to make a laboratory study of seven brands of silk hosiery that seemed to be very popular among the women questioned. As more than one weight within a brand was worn, the studies included twelve kinds of hose, (a) designating chiffon weight and (b, service weight.

The study was made up of two parts, standard laboratory textile tests and wearing tests.

From the laboratory tests were derived the specifications used in manufacturing the hose. These consisted of the following:

Measurements

a. Length of hose (7)

b. Length of foot (6)

c. Depth of hem

d. Width of hem, flat (top) (7)

e Width of hem, stretched (top) (7)

f. Width of leg, flat (top of fashion marks)

g. Width of leg, stretched (top of fashion marks)

h. Width of ankle, flat (narrowest place) (7)

i. Width of ankle, stretched (narrowest place (7)

Weights

a/ Weight per hose (unconditioned)

b. Weight of total silk per hose

c. Weight of total cotton per hose

d. Weight of 3 two-inch samples from outside of hem (8)

e. Weight of 3 two-inch samples from leg (taken two, twelve and eighteen inches down from bottom of hem (8).

f. Weight of 3 one-inch samples cut from heel

Details in Construction

a. Number of wales per inch (7)

b. Number of courses per inch (8)

c. Diameter of yarn (90

d. Twist count (Percision twist counter) (9)

e. Seam count (7)

f. Number of fashion marks

Determinations of Strength

a. Bursting strength (Mullen Tester)

b. Breaking strength (Scott Tester) (8)

Chemical Tests

a. Compositon of fiber (Lowe's solution) (9)

The wearing tests were conducted to determine the relative durability of silk hose under actual wearing conditions. For this, thirty women were secured to act as experimental subjects. Each woman was assigned five pairs of hose of different kinds to be furnished her in daily rotation. A white linen tape bearing the wearer's name and the number given to the pair, was sewed into the top of each stocking. A loop of white thread was placed in the top of one stocking to indicate that it should be worn on the right foot.

One pair of hose was delivered to each wearer per day. It was placed in a small manila paper bag, with a slip attached to it by a paper clip. On the slip the wearer recorded the date; the time when the hose was put on and when taken off; the amount of walking, usual, more or less than usual; and the kind of a shoe worn - pump, light oxford, or low-heeled oxford.

Each pair of hose was collected, after one day's wear, to be laundered. For this process, an aluminum hand washer with a suction cup plunger was used. Fig. 1. Into this was poured six quarts of warm

Fig. 1. Two views of machine used in laundering silk hosiery

water at a temperature of 110°F. and 15 grams of Ivory soap flakes were thoroughly dissolved in it. Ten pairs of hose were washed at one time. Fifty strokes of the plunger were used for washing, then the hose were squeezed by hand and freed from soapy water. The hose were rinsed twice, each time in six quarts of water at 110°F. with fifty strokes of the plunger. In both cases they were squeezed to remove water. Each hose was then stretched slightly lengthwise and along the foot, hung over a soft cotton line by the top, with just the hem hanging over, and allowed to dry in a warm basement room.

After laundering, the hose were inspected with a darning ball for holes, and were mended if the holes were in the foot or in the upper part of the leg where they would not be visible. All wear was recorded. The loops of white thread were changed to the other hose in every pair to alternate the wear. They were then delivered to the wearers. When the hose showed visible wear, they were called worn out and were put aside to be examined at the end of the test and compared with new hose of the same kinds.

A drawing was obtained of each experimental subject's feet and questions were asked about foot troubles, such as corns, callouses and bunions, condition of the nails, kind and size of shoes worn with the tested hose, condition of shoe linings, kind and condition of hose supporters, degree of perspiration, body weight, and estimated usual amount of walking. Measurements were taken of the ankle, four inches above the heel; of the thigh, four inches above the knee cap; and of the leg, twelve inches above the heel.

From the opinions obtained from merchants and consumers, and

from laboratory studies of hose specifications and wearing tests, the following results were obtained.

RESULTS

Information gathered from the fifteen stores that sold women's silk hosiery, showed that in all thirty-four different brands were carried and from one to five kinds within a brand might be purchased. The prices ranged from thirty cents to five dollars per pair. The sales-people thought their customers were influenced most by price and color, but the majority of women also considered weight, smoothness, evenness of weave, shape and the placing of reinforcements. They reported that interest was shown in the materials used, the women preferring silk to rayon in the leg of hosiery, but divided in their preference for silk or cotton hems. Half of the stores believed that a silk foot was most popular, while the other half thought little attention was paid to materials used in the feet. They thought most women asked about wearing qualities of hose and that this influenced their selection. It was interesting to note that the sales-people stated that women were buying hose in the longest lengths of leg.

Personal interviews with a large number of women in the community furnished some valuable information about their methods of selecting hosiery, their ways of caring for hosiery and their opinions about its wearing quality. Two hundred and fifty women were interviewed, the group consisting of 54 students, 25 clerks and stenographers, 28 teachers, 100 town homemakers and 42 rural homemakers. In Table I, it will be seen that these women were forty-seven brands of silk and

rayon hosiery. The trade-marked names of these brands are not included in this study but they will be disignated by Roman numerals. The number of women wearing the various weights in these brands, and the price paid per pair are also shown in Table I.

TABLE I. NUMBER OF BRANDS OF SILK HOSIERY WORN BY WOMEN INTERVIEWED, GIVING NUMBER OF WEARERS FOR EACH WEIGHT IN BRAND AND THE PRICE PAID.

Brands of silk hosiery	No. of women wearing Service wgt.	Price per pair	No. of women wearing Semi-chiffon	Price per pair	No. of women wearing Chiffon	Price per pair
I	53	$1.50	44	$1.95	64	$1.95
II	37	1.95	25	1.95	37	1.95
III	25	1.95	14	1.95	11	1.95
IV	34	1.95	30	1.95	35	1.95
V	9	1.50	2	1.50	0	-
VI	17	.98	2	.98	2	.98
VII	23	1.50	5	1.50	7	1.50
VIII	13	1.50	8	1.95	14	1.95
IX	2	1.50	1	1.95	1	1.95
X*	6	1.00	-	-	-	-
XI	19	1.50	8	1.50	5	1.95
XII	2	1.95	-	-	-	-
XIII	3	1.95	-	-	-	-
XIV	1	1.25	-	-	-	-
XV	2	1.25	-	-	-	-
XVI	1	.85	-	-	-	-
XVII	2	.85	-	-	-	-
XVIII	1	1.00	-	-	-	-
XIX	1	1.95	3	1.95	4	1.95
XX	2	1.50	-	-	-	-
XXI	1	1.50	-	-	2	1.50
XXII	1	1.00	-	-	-	-
XXIII	1	1.50	-	-	-	-
XXIV	1	1.65	-	-	-	-
XXV	1	1.65	-	-	-	-
XXVI*	2.	.30	-	-	-	-
XXVII	1	.89	-	-	-	-
XXVIII	1	1.00	-	-	-	-
XXIX	12	1.95	9	1.95	9	1.95
XXX	1	?	-	-	-	-
XXXI	1	1.95	-	-	-	-
XXXII	1	1.50	-	-	1	1.95
XXXIII	1	1.50	-	-	1	1.95
XXXIV	1	1.00	1	1.49	-	-
XXXV	2	1.35	1	1.95	1	1.95
XXXVI	2	1.60	-	-	-	-
XXXVII	1	1.65	-	-	-	-
XXXVIII	1	1.45	-	-	-	-
XXXIX	2	1.00	-	-	-	-
XL	1	1.95	-	-	-	-
XLI	1	1.35	-	-	-	-

*- These hose are believed to be made of artificial silk

TABLE I (Cont'd)

XLII	-	-	1	2.95	-	-
XLIII	-	-	1	1.50	1	1.95
XLIV	-	-	1	1.45	-	-
XLV	-	-	1	1.95	-	-
XLVI	-	-	-	-	2	2.95
XLVII	-	-	-	-	1	1.95
XLVIII	-	-	1	?	-	-

In Table II, may be seen the general factors influencing the selection of hosiery by each of the five groups of women interviewed. The factors listed were: advertisements, store's reputation, salesperson's opinion, the opinion of others, price, weight of hose and wearing qualities of hose. Wearing qualities and price seem to be the outstanding factors influencing selection.

Table III gives construction factors that influenced the selection of silk hosiery by each of the five groups interviewed. The general construction factors listed were: materials used in hose, shape, length, special sizes, weaves and appearance. Appearance, shape and materials used seem to have equal influence upon selection.

Table IV shows the number of women in each of the five groups using the different methods of caring for hosiery. This summarizes the answers to questions about: frequency of laundering, kind of water used, temperature of water used, methods of washing, methods of applying soap, methods of wringing, methods of rinsing, methods of shaking out, methods of hanging and places of hanging. The majority of these women washed their hose after the first wearing, with tap water of a moderately warm temperature and with soap flakes. The motion used in washing and rinsing was squeezing. The hose were then stretched in the length of the leg and foot, laid over a line in the shade out-of-doors or out of a draft indoors. This report was valuable in selecting a uniform laboratory method for laundering hose.

TABLE II. NUMBER OF WOMEN INFLUENCED BY GENERAL FACTORS IN SELECTING SILK HOSIERY

General factors influencing selection	Number of Women				
	Students	Stenographers	Teachers	Town Homemaker	Rural Homemaker
Advertisements	42	12	10	29	31
a. New colors	23	11	5	13	9
b. Materials	9	2	3	1	22
c. Price	21	11	5	21	22
d. New Weaves	3	7	2	9	1
e. New heels	16	7	2	13	3
f. Lengths	15	1	4	6	12
g. Run-proof	10	7	0	10	13
h. Snag-proof	13	3	1	3	9
Store's reputation	26	5	17	70	21
Sales person's opinion	11	11	9	50	7
Opinion of others	18	11	13	40	13
Price	33	16	19	79	23
Weight of hose	29	17	18	53	19
Wearing quality	37	21	27	94	26

TABLE III. NUMBER OF WOMEN INFLUENCED BY CONSTRUCTION FACTORS IN SELECTING SILK HOSIERY

Construction factors influencing selection	Number of Women				
	Students	Stenographers	Teachers	Town Homemaker	Rural Homemaker
Materials used	52	23	27	84	36
a. Silk leg	52	23	26	84	33
b. Rayon leg	2	1	4	4	5
c. Silk hem	48	20	18	51	14
d. Cotton hem	20	10	15	61	22
e. Silk feet	38	20	13	51	14
f. Rayon feet	1	1	1	2	2
g. Cotton feet					
h. Silk and cotton feet	31	9	19	63	14
i. Rayon and cotton feet	2	1	1	2	4
Shape	51	25	28	99	36
a. Tubular	0	0	0	0	2
b. Full-fashioned	51	25	28	99	32
Length	50	21	20	82	36
a. Long	34	7	11	55	21
b. Medium	13	10	8	20	15
c. Short	2	3	1	9	1
Sizes (Special)	2	0	0	0	4
Weave	46	18	10	22	26
a. Regular	18	3	1	3	24
b. Dull Twist	27	16	9	19	3
Appearance	53	23	28	97	34
a. Smoothness	33	20	18	79	22
b. Sheen	34	20	14	75	7
c. Even weave	25	22	21	89	19
d. Shape of reinforcements	24	20	22	88	16
e. Picot-edge	17	4	5	10	6
f. Colors available	34	19	25	73	16

TABLE IV. THE NUMBER OF WOMEN WHO REPORTED THE USE OF VARIOUS METHODS OF CARING FOR SILK HOSIERY

Methods of caring for silk hose	Number of Women				
	Students	Stenographers	Teachers	Town Homemaker	Rural Homemaker
Frequency of laundering					
a. After first wearing	35	18	19	46	25
b. After second wearing	18	7	6	26	9
c. After third wearing	2	2	4	34	2
d. After several pairs have accumulated	29	8	9	49	6
Kind of water used					
a. Tap	50	25	27	98	20
b. Soft	4	3	1	2	22
Temperature of water					
a. Tepid	2	3	2	25	11
b. Moderately warm	52	22	26	75	30
Method of washing					
a. Squeezing	23	12	16	61	26
b. Rubbing - hand	35	15	15	53	14
c. Rubbing - board	1	1	2	12	6
d. In washing machine	0	0	0	6	3
e. Two soapy waters	12	2	4	21	5
Method of applying soap					
a. Soap rubbed on	36	13	13	39	9
b. Soap in solution	20	17	21	73	31
Method of wringing					
a. Twisting	13	10	12	22	4
b. Squeezing	41	18	22	83	27
c. Through wringer	0	0	0	2	11
Method of rinsing					
a. Once	19	7	6	29	8
b. Twice	35	18	22	71	31
Method of shaking out					
a. Stretching length of leg	38	11	14	32	17
b. Stretching length ft.	34	14	13	44	12
c. Stretching width of leg	5	4	6	18	8
d. Snapping	7	4	5	15	4

TABLE IV (Cont'd)

Method of hanging					
a. By toes	21	6	2	22	15
b. By hems	17	7	9	35	21
c. Laid over line	25	13	20	55	3
d. Right side out	33	16	19	53	6
e. Wrong side out	26	12	13	62	31
Place of hanging					
Outdoors	43	14	5	65	38
a. In sun	10	2	1	14	9
b. In shade	33	12	4	51	29
Indoors	51	23	29	100	16
a. In draft	26	7	5	22	6
b. Out of draft	25	16	24	81	10

Table V presents the number of women in each group that purchased various numbers of pairs of hose per year in all weights; in service weight; and in chiffon weight. The number of hose purchased per year vary greatly for different groups, ranging from four to sixteen pairs for the majority of women.

Table VI gives the number of women reporting various places where wear in hosiery first appears. Places of wear listed were: hole in toe, thin place in heel, runs in leg and breaks in knee.

Table VII shows the sizes of hose worn with different sizes of shoes as reported by the women interviewed. There was a great variety of sizes of hose worn with the same size of shoe. These hosiery sizes were also compared with sizes recommended by manufacturers to correspond to certain shoe sizes.

Tables VIII, IX, X and XI present the construction specifications used in the manufacture of the seven brands of hose studied. These include measurements, fashion-marks, seam count, weights, wales, courses, yarn number, yarn twist, bursting strength and breaking or tensile strength. This set of data is particularly valuable in helping to establish a relationship between types of construction and wearing quality of silk hosiery.

Table XII is a record of the wear received from the hose studied, first giving the brands worn; then the number of experimental subjects wearing each brand; the average number of hours each brand was worn; the number of pairs worn out with the average number of hours they were worn; and lastly, the number of pairs left in wearing condition at the end of the test period, with the average number of hours they had been worn.

TABLE V. NUMBER OF WOMEN REPORTING THE VARIOUS NUMBERS OF PAIRS OF SILK HOSE PURCHASED PER YEAR: (a) TOTAL PAIRS, (b) SERVICE WEIGHT, (c) CHIFFON WEIGHT.

Total no. pairs (a) purchased per year	Number of Women				
	Students	Stenographers	Teachers	Town Homemakers	Rural Homemakers
0 - 4	0	0	0	0	18
4 - 8	1	2	3	29	14
8 - 12	2	1	6	31	3
12 - 6	16	9	11	23	4
16 - 20	11	3	5	10	2
20 - 24	12q	2	1	2	0
24 - 28	7	5	2	3	0
28 - up	5	3	0	2	1
No. Service (b) wgt. pairs purchased per year	Students	Stenographers	Teachers	Town Homemakers	Rural Homemakers
0 - 4	13	14	8	29	24
4 - 8	20	3	7	42	10
8 - 12	8	0	8	17	5
12 - 16	13	6	4	10	2
16 - 20	0	0	1	1	0
20 - 24	0	0	0	0	0
24 - 28	0	1	0	1	0
28 - up	0	1	0	0	1
No. Chiffon (c) wgt. pairs purchased per year	Students	Stenographers	Teachers	Town Homemakers	Rural Homemakers
0 - 4	5	5	12	48	38
4 - 8	11	5	6	22	3
8 - 12	13	3	1	11	1
12 - 16	6	3	3	14	0
16 - 20	10	3	4	2	0
20 - 24	6	0	0	0	0
24 - 28	0	5	2	3	0
28 - up	3	1	0	0	0

TABLE VI. NUMBER OF WOMEN REPORTING PLACES WHERE WEAR FIRST APPEARS IN SILK HOSIERY

Place where wear first appears	Number of Women				
	Students	Stenographers	Teachers	Town Homemakers	Rural Homemakers
Hole in toe	20	6	10	20	18
Thin place in heel	38	17	18	59	29
Runs in leg	26	8	5	32	18
Break in knee	4	0	1	9	7

TABLE VII. SIZES OF SHOES AND HOSE WORN BY WOMEN INTERVIEWED.

Size of shoe worn	Size of hose worn	Size recommended by manufacturer
3	$8\frac{1}{2}$	8
$3\frac{1}{2}$	$8\frac{1}{2}$ to $9\frac{1}{2}$	8
4	8 to $9\frac{1}{2}$	$8\frac{1}{2}$
$4\frac{1}{2}$	$8\frac{1}{2}$ to $9\frac{1}{2}$	$8\frac{1}{2}$
5	$8\frac{1}{2}$ to 10	9
$5\frac{1}{2}$	$8\frac{1}{2}$ to $9\frac{1}{2}$	9
6	9 to $10\frac{1}{2}$	$9\frac{1}{2}$
$6\frac{1}{2}$	9 to 10	$9\frac{1}{2}$
7	9 to $10\frac{1}{2}$	10
$7\frac{1}{2}$	$9\frac{1}{2}$ to $10\frac{1}{2}$	10
8	$9\frac{1}{2}$ to $10\frac{1}{2}$	$10\frac{1}{2}$
$8\frac{1}{2}$	10 to $10\frac{1}{2}$	$10\frac{1}{2}$ outsize
9	$10\frac{1}{2}$	

TABLE VIII. CONSTRUCTION SPECIFICATIONS (MEASUREMENTS) DETERMINED FOR SEVEN BRANDS OF SILK HOSIERY STUDIED

Brands studied	Average length of hose	Average length of foot Size $9\frac{1}{2}$	Average width of ankle flat	Average width of ankle stretched	Average width of leg flat	Average width of leg stretched	Average width of top flat	Average width of top stretched
I a*	30.4 in.	9 in.	3.7 in	7.1 in.	4.9 in.	10.1 in.	6.1 in.	12.6 in.
I b*	28.2	9 3/8	3.7	6.5	4.9	9.1	6.4	12.3
II a	30.6	8 3/4	3.9	6.4	4.9	9.5	6.0	10.5
II b	30.3	$9\frac{1}{2}$	3.4	6.5	4.8	9.1	6.3	11.8
III a	29.8	9 1/8	3.6	5.9	4.7	8.7	6.1	10.9
III a*1	31.2	9 1/4	3.6	6.9	4.8	9.8	6.3	11.4
III b	30.3	9 1/4	3.4	5.9	4.8	8.4	6.7	10.8
IV a	30.6	9	3.8	6.2	4.6	8.7	6.0	10.6
IV b	30.6	9 1/4	3.9	6.3	4.8	8.3	6.6	9.6
V b	30.3	9 1/2	3.8	7.2	5.2	9.4	6.4	11.9
VI b	29.9	9	3.6	6.1	4.9	8.5	6.4	10.4
VII b	32.5	9 1/2	3.5	7.0	4.8	10.2	6.6	13.0
VII b1	31.6	9 1/2	3.8	6.6	4.8	9.7	6.4	13.0

*

*a - Chiffon weight
*b - Service weight
*a1 - Dull twist

TABLE IX. CONSTRUCTION SPECIFICATIONS (FASHION-MARKS AND SEAM COUNT) DETERMINED FOR SEVEN BRANDS OF SILK HOSIERY STUDIED

Brands studied	No.of top fashion-marks	No.of leg fashion-marks	No.of heel fashion-marks	No.of sole fashion-marks	Seam count per inch	Shape of toe block
I a*	0	36	11	8	13	square
I b*	0	31	11	6	16	cradle
II a	0	(37-size 10 (32-size 9	10	12	19	cradle
II b	8	28	9	9	15	cradle
III a	4	31	13	8	15	square
III a*1	4	31	13	8	15	square
III bq	6	24	11	7	14	cradle
IV a	9	32	11	7	13	square
IV b	6	27	11	7	16	square
V	5	25	13	7	15	square
VI	7	31	10	6	13	cradle
VII b	8	30	10	11	11	double squares
VII b1	5	28	11	8	15	square

*a - Chiffon weight
*b - Service weight
*a1 - Dull twist chiffon

TABLE X. CONSTRUCTION SPECIFICATIOSN (WEIGHTS) DETERMINED FOR SEVEN BRANDS OF SILK HOSIERY STUDIED

Brands studied	Weight per single hose	Weight of silk per hose	Weight of cotton per hose	Ave. wgt. of 2 inch sample from boot	Ave. wgt. of 2 inch sample from heel	Ave. wgt. of 2 inch sample from hem
I a*	16.8911g.	12.9330g.	4.0830g.	.1466g.	.0853g.	.1485g.
I b*	26.2700	12.9810	13.3882	.2346	.1431	.3579
II a	10.2519	8.9344	1.315	.0873	.0681	.1525
II b	17.0242	10.6970	6.383	.1379	.0781	.1391
III a	12.3620	10.6521	1.8311	.0991	.0919	.1462
III a'*	10.8353	8.6401	2.1478	.0860	.0768	.1468
III b	19.6620	9.1173	10.5494	.1582	.1602	.2321
IV a	12.7059	10.6834	2.043	.1101	.0810	.1473
IV b	25.1129	11.2424	13.8603	.2012	.1445	.3150
V b	23.1970	11.6371	11.6591	.2041	.1248	.3015
VI b	24.8220	11.9245	13.0220	.2273	.1278	.3087
VII b	19.2971	8.9711	10.4954	.1488	.1312	.2700
VII b*	19.0602	8.4150	10.6520	.1391	.1333	.2699

*a - Chiffon weight
*b - Service weight
*a'- Dull twist chiffon

TABLE XI. CONSTRUCTION SPECIFICATIONS AND TESTS MADE ON SEVEN BRANDS OF SILK HOSIERY STUDIED

Brands studied	No. of wales per inch	No. of courses per inch	Yarn number	Yarn twists per inch	Average bursting strength Hem	Average bursting strength Leg	Average breaking strength of Leg
I a*	30	45	65	9	143.0lbs.	103.0lbs.	664.5lbs.
I b*	31	47	43	5	128.3	147.5	105.5
II a	32	53	67	12	147.5	66.0	14.0
II b	30	50	64	8	145.0	109.3	38.3
III a	30	47	61	3	164.0	83.3	46.5
III a'*	30	43	71	23	161.3	70.7	15.7
III b	28	44	59	2	96.3	118.7	77.0
IV a	34	44	77	3	156.0	88.7	45.5
IV b	30	41	49	3	140.0	127.0	106.0
V b	30	46	49	7	133.7	143.0	90.8
VI b	34	44	48	12	121.0	141.3	87.5
VII b	33	45	69	3	111.7	106.3	60.5
VII b'	31	38	72	2	115.3	112.0	59.7

*a - Chiffon weight
*b - Service weight
*a'- Dull twist chiffon

TABLE XII. RECORDS OF ON-THE-FOOT WEAR OF SEVEN BRANDS OF SILK HOSIERY STUDIED

Brand of silk hosiery	No. of wearers	Ave. no. hours worn	No. pairs worn out	Ave. no. hours worn	No. pairs still wearable	Ave. no. hours worn
I a*	8	170:15	5	123:00	3	249:05
I b*	7	224:40	5	187:40	2	317:10
II a	16	86:25	16	86:25	0	- -
II b	16	233:25	11	213:25	5	277:35
III a	12	208:45	12	208:45	0	- -
III a'*	2	46:15	2	46:15	0	- -
III b	14	211:00	11	179:25	3	327:00
IV a	15	170:45	14	164:50	1	253:50
IV b	14	219:45	10	192:10	4	288:40
V b	16	313:25	5	281:55	11	327:40
VI b	8	193:35	5	159:40	3	250:10
VII b	14	202:50	10	170:20	4	284:00
VII b'	5	195:15	4	181:10	1	251:30

*a = Chiffon weight
*b = Service weight
*a' = Dull twist chiffon

Table XIII gives the number of hours each person wore each of the five pairs allotted to her, specifying those not worn out and those worn out from accidents such as acid burns or falls. This table shows that people differ in the rate at which they wear out hose.

Table XIV gives personal data about each wearer, which is intended to help in determining the individual differences that have made variations in the wear of the brands of hosiery studied.

Table XV gives additional personal data about the wearers. It also records for each person the places where hosiery wear most frequently occurred. The place of greatest wear was listed first; the next greatest second. The final wear was underscored.

TABLE XIII. THE NUMBER OF HOURS OF WEAR GIVEN TO EACH PAIR OF SILK HOSE BY EACH WEARER IN THE EXPERIMENT

Wearer	1st pair		2nd pair		3rd pair		4th pair		5th pair	
	Kind	Hours	Kind	Hours	Kind	Hours	Kind	Hours	Kind	Hours
1	II b	369:20	III b	295:35	V b	447:10*	IV a	91:50#	III a	263:20
2	II b	233:20	III b	452:45*	V b	461:50*	IV a	46:15	I b	361:40*
3	II b	321:10*	III b	212:55	V b	313:45*	IV a	253:50*	I a	28:15
4	II b	292:35*	III b	243:30*	V b	284:50*	IV b	302:10*	I a	212:45*
5	II b	318:45*	III b	284:45*	V b	303:15*	IV b	276:45*	VII b'	251:30*
6	II a	38:00	III a	266:45	VII b	317:30	IV b	234:30	I b	77:00
7	II a	97:00	III a	160:10	I b	162:55	IV b	205:00	IV a	60:00
8	II a	92:15	III a	166:30	VII b	203:30	IV b	154:00	I b	122:30
9	II a	81:15	III a	203:05	VII b	197:45	IV b	141:55	VI b	148:30
10	III b	199:35	II b	329:00	V b	357:20*	IV a	256:30	VI b	329:30*
11	II b	317:15	III b	297:20	V b	302:50*	IV a	213:15	I b	232:30
12	II b	118:30	III b	63:15	V b	291:25	IV a	160:00	VI b	205:15
13	II b	322:50*	III b	248:30	V b	329:55*	IV a	199:25	I b	272:45*
14	II a	232:45	III a	230:40	VII b	347:00*	IV b	255:45*	VI b	240:00*
15	II a	39:30	III a'	27:30	VII b	164:00	IV b	179:15	VI b	189:00
16	II b	267:30	II b	292:00	V b	373:00	VII b	298:40*	VII b'	239:00
17	II b	32:30	III b	229:00	V b	363:45*	IV a	347:00	I b	343:30
18	II b	132:30*	III b	156:00	V b	318:00*	IV a	247:45	I a	232:30
19	II a	91:00	III a	158:00	VII b	174:00	V b	122:00*	VI b	181:00*
20	II a	0:00	III a	------	VII b	------	IV b	------	VI b	23:30
21	II a	114:00	III a	233:10	VII b	352:15*	IV b	326:00	IV b	320:00*
22	II b	176:50	III b	106:45	V b	252:50	IV a	146:50	I a	148:45
23	II b	52:00	III b	88:30	V b	289:45	IV a	85:00	VII b'	209:40
24	II a	31:50	II a	214:10	VII b	138:05*	I a	240:55*	VII b'	118:40
25	II b	159:00	III b	75:50	V b	202:45	IV a	114:30	I a	65:30
26	II a	23:30	III a	259:30	VII b	145:45#	IV b	78:30	I a	293:30*
27	II a	37:30	III a	146:35	VII b	69:30#	IV a	102:40	VII b'	162:30
28	II a	161:30	III a	235:00	VII b	216:00	IV a	236:00	IV b	241:30
29	II a	72:00	III a	182:30	VII b	133:00	IV b	184:00	I a	140:00
30	II a	57:00	III a'	65:00	VII b	82:00	IV b	177:00	VI b	231:00

a - Chiffon weight
b - Service weight
* - Not worn out
\# - Accident
------ Left before end of experiment

TABLE XIV. PERSONAL DATA ABOUT EACH WEARER IN THE EXPERIMENT

Wearer	Weight lbs.	Size of ankle	Size of leg	Size of thigh	Length of foot	Size of shoe	Kind of shoe	Condition of shoe lining
1	145	9½ in.	15 in.	17½ in.	9 3/4 in.	7½AAA	Kid, pump	Holes in heels
2	168	10	15½	20	9 1/4	6½B	Patent, pump	Nails in heels
3	158	8½	13½	16½	9 5/8	6½B	Kid, pump	Nail in one heel
4	130	7 3/4	13	16½	8 7/8	4 AA	Kid, pump	Holes in soles
5	112	8	11	15½	9 1/2	6 AAAA	Kid, lt.oxford	Arch supports
6	150	8 7/8	11 3/8	16½	9 5/8	6 B	Kid, oxford	Curled lining
7	128	9 1/4	14 3/4	16 3/4	9	5	Kid, oxford	Good
8	108	8	12½	13 7/8	9 1/4	6 AA	Kid, oxford	Holes and nails
9	145	9 1/8	13 3/8	17	10	7½A	Kid and calf oxfords	Good
10	177	9 1/4	15 1/4	18 1/4	10	8 AAA	Kid, oxford	Good
11	115	8 1/4	12 3/4	15½	9 3/8	6 AA	Kid, pump	Good
12	163	9 1/4	15 1/4	19	9 3/4	7½AA	Kid, lt.oxford	Arch supports
13	135	8 1/4	12½	15 3/4	10	7½AAA	Kid, pump	Nails in heels
14	115	8½	13	14½	9 3/4	7 AAA	Kid, lt.oxford	Heel protectors
15	150	9½	15½	18½	9 1/4	7	Kid, pump	Good
16	155	8 3/8	14 5/8	18	9½	6 C	Kid, lt.oxford	Good
17	150	8½	12 3/4	16 3/4	9 7/8	7½	Calf, oxford	Holes in toes
18	117	8	12 3/4	15 1/4	9 1/4	5-5½	Kid, pump	Heel protectors
19	126	9	13 1/4	15 1/2	10	8½AAA	Kid, pump	Good
20	140	9	14½	18	10 1/4	8 AAA	Kid, lt.oxford	Nails in heels
21	110	7½	11½	15	9	5A-5B	Kid, oxford	Nails in heels
22	101	8 1/4	12	14 1/8	9 3/4	6 AAA	Calf, oxford	Good
23	125	8 3/4	13 3/8	15½	9 5/8	6	Calf, oxford	Heavy seams
24	117	9	13	15	9 1/4	6 AAA	Kid, lt.oxford	Good
25	123	9½	14 1/8	15½	9 5/8	6½A	Kid, pump	Holes in sides of heels
26	125	8 3/4	14½	16 3/4	9 3/4	7	Kid, lt.oxford	Good
27	107	8	13 1/4	14 3/4	8 7/8	4 C	Kid, lt.oxford	Nails in heels
28	120	8 3/4	14	16 5/8	9 3/16	4½B	Kid, oxford	Good
29	128	9	13 1/4	15½	9 13/16	7AAAA	Kid, lt.oxford	Good
30	138	8 3/4	13½	17	10 1/8	7½	Kid, oxford	Good

TABLE XV. ADDITIONAL PERSONAL DATA ABOUT EACH WEARER IN THE EXPERIMENT

Wearer	Condition of feet	Degree of perspiration	Temperature of feet	Usual amount of daily walking	Occurrence of wear in hose
1	Callouses	Large	Warm	15 blks.	Holes in heels* Holes in foot
2	Callouses and corns	Small	Warm	0	Holes in hem;holes in heel
3	Callouses; corns on toes	Moderate	Warm	0	Holes in foot; runs
4	Callouses;corns on toes	Moderate	Cold	0	Holes in hem;holes in foot
5	Callouses on toes	Small	Cold	0	Rips in seams
6	Callouses	Moderate	Warm	24	Holes in foot; runs
7	Corns on little toes	Small	Warm	13	Holes in heels; holes above toe block
8	Callouses on toes	Moderate	Cold	30	Holes in heels
9	Corns on little toes	Large	Warm	10	Holes in heels
10	Callouses on toes	Small	Warm	8	Holes in toes;holes in heels
11	Callouses	Small	Cold	12	Holes in toes;holes in heels
12	Callouses and corns	Small	Warm	9	Holes in toes;holes in heels
13	Perfect	Moderate	Cold	20	Holes in hem;holes in heels
14	Corns	Large	Cold	4	Holes in sole;holes in heels
15	Callouses;corns on toes	Small	Warm	28	Holes in toes; runs
16	Callouses	Moderate	Warm	16	Holes in toes;holes in heels
17	Corn on little toe	Moderate	Warm	6	Holes above toe block; Holes in heels
18	Corns	Large	Cold	0	Holes in heels; holes above toe block
19	Bunions; corns	Moderate	Cold	30	Holes in heels; runs
20	Corns; callouses	Large	Warm	0	Holes in toes; runs
21	Corns on little toes	Moderate	Warm	3	Holes above toe block; runs
22	Corns on little toe	Moderate	Cold	28	Holes in heels
23	Corn on little toe	Moderate	Warm	32	Holes in foot;holes in heels
24	Corns	Small	Cold	32	Runs; holes in foot
25	Corns and callouses	Large	Warm	32	Holes in heels;holes in foot
26	Callouses	Moderate	Warm	32	Runs;holes above toe block
27	Callouses and corns	Moderate	Warm	32	Holes in heels;holes in foot
28	Callouses	Moderate	Warm	32	Holes in heels;holes in toes
29	Perfect	Moderate	Cold	32	Holes in toes;holes in heels
30	Callouses; corns	Moderate	Cold		Holes in heel

* - Final wear underscored

DISCUSSION

Out of the forty-seven brands of hose worn by the women interviewed, eleven appeared to be most popular and of these, the first seven listed (Table I) were selected for the wearing test. Numbers V and VI were chosen because they were worn so generally by the rural home-makers. The others selected were outstandingly popular.

The general tendency of the women, taken as a whole, was to purchase service weight rather than chiffon. In selecting hosiery, the majority of women were influenced, first, by wearing quality and most of them had tried more than one brand during the year. Price also had considerable influence on their selection and the popular price paid was $1.95. Other factors affecting selection varied greatly in different groups; the town home-makers and teachers were influenced by a store's reputation; the students and rural home-makers were greatly influenced by advertisements, chiefly of new colors and price. The town home-makers were decidedly swayed by a sales-person's opinion. These differences are probably due to the fact that teachers and town home-makers live in a town long enough to gain confidence in a store. Rural home-makers probably notice advertisements because they often do some of their buying through mail order catalogs. Since students are apt to think more about style in hosiery, they would naturally be influenced by advertisements.

As for construction factors, the majority of the women in all the groups were influenced by shape, preferring full-fashioned, and by appearance, evenness of weave, and colors available. Only about half of the women interviewed were interested in weight of hose showing that

half of them were not conscious of a differnece in service weights and in chiffons. All were influenced by the material from which the hose were made, preferring a silk leg to any other, and it was interesting to note that the majority also preferred a long length of leg.

The method of caring for hosiery used by most of these women was: laundering hosiery after one wearing, but after several pairs had accumulated; using soap flakes with moderately warm tap water; employing both squeezing and hand rubbing; rinsing twice; stretching the hose in length of leg and foot; and hanging over the line, wrong side out, indoors and out of a draft.

The number of pairs purchased per year by the women interviewed varied considerably in the different groups. Students purchased the greatest number of pairs, town home-makers next and teachers, stenographers and rural home-makers in the order mentioned. These differences are probably due to the fact that students may be extravagent because they are not spending their own money for clothing, and in addition they lead a very active student and social life. Housework probably causes more wear to hosiery than any other work done by the women interviewed, which may explain why town home-makers come second in their purchases of hosiery. Stenographers use relatively a large number of pairs of hose per year because most of them purchase a chiffon weight. Rural home-makers wear fewer pairs of silk hose for the reason that they wear a great deal of cotton hosiery, it being more suited to their kind of work. There is a tendency for students and stenographers to wear more chiffon hose than service weight; for rural home-makers to wear service weight almost entirely and for town home-makers and

teachers to wear about equal amounts of both chiffon and service weight hose. Since those who wear chiffon hose also wear a greater number of pairs per year, it seems to point to the fact that chiffon hose do not wear as well as service weight, although about half of the women interviewed did not agree with this idea.

In general, wear in hosiery appeared first in the heel, next from runs in the leg and next in the toes. Town home-makers and rural home-makers reported more first wear from breaks in the knee than any other groups. This is probably due to their type of work.

A great variation was noticed in the sizes of hose worn with certain sizes of shoes. This was outstanding in the case of a size 5 shoe, where the hose worn with it varied from size $8\frac{1}{2}$ to 10. This may not be so significant since no standard method of measuring hosiery has been adopted. As compared with the sizes recommended by manufacturers for certain sizes of shoes, the majority of women tend to buy their hosiery too short in length of foot.

A method of standardizing sizes of hosiery has been suggested in a U. S. Bureau of Standards circular (6), although it has not been adopted by hosiery manufacturers. According to this suggestion, a hose measuring 9 inches in the foot should be marked a number 9, etc. Out of the thirteen kinds of hose studied only four were full length. The greatest deviation was three-fourths of an inch too short in one kind, while none of the hose measured more than full length.

There was a uniformity in the width of ankle measured flat and also in the width of leg, flat, except in Vb which measured 5.2 inches as compared with an average of 4.8 inches in the others. Vb also had the greatest

stretch in the ankle and the wearers complained of it as being rather ill-fitting. Numbers Ia, IIIa' and VIIb also had a great deal of stretch in the ankle. Numbers IIIa and IIIb had the least amount of ankle stretch. The leg measurements varied from 4.6 to 5.2 inches flat and from 8.3 to 10.2 inches stretched. From the results it would appear that the stretch of the ankle has a relationship to wear.

Number Vb had the least number of fashion-marks which probably accounts for its poor fitting ankle. IIa had the most fashion-marks and fitted well in the ankle. The seam count ranged from 11 to 19 stitches to the inch. This varied somewhat with the brands of the hose, but seemed to bear no direct relationship to wear.

The weight of a single hose ranged from 10.2 to 26.2 grams. The amount of silk in service weight varied from 8.4 to 12.9 grams, the amount of cotton from 6.3 to 13.8 grams. In chiffons the weight of silk varied about the same amount, 8.6 to 12.9 grams. This is probably the reason why service weight and chiffon hose sell for about the same price. The amount of cotton used in chiffon hose ranged from 1.3 to 4 grams. The weight of a 2-inch sample from the boot of a service weight hose varied from 0.13 to 0.23 grams, and in chiffon from 0.08 to 0.14 grams. The chiffons having a leg in which a 2-inch sample weighed 0.08 grams, were the poorest wearing hose, however, the weight of a 2-inch sample from service weight hose was not an index to their wearing quality, as the second best wearing hose weighed the least among the samples from service weights.

The number of wales per inch was about the same in all of the hose studied. The number of courses per inch varied to some degree,

IIa and IIb having the greatest number and VIIb', the least. The majority had about 44 per inch. While the number of wales determined the gauge or fineness of hosiery, a larger number did not seem to insure greater wear.

The yarn number, referring to the size of the yarn, varied considerably. For chiffons the yarn number ranged from 61 to 77, and for service weights from 43 to 72. The best wearing hose had the largest yarns and the poorest, the smallest yarns. This point of difference was very outstanding and consistent.

Twist seems to be closely related to wear, although there is a limit to the twist suited to each size of yarn. The poorest wearing hose had the most twist and the best wearing, a moderate amount. For chiffon hose, the twists varied from 3 to 23 per inch and for service weight from 2 to 12 per inch. The best wearing service weight had a twist of 7, and the best wearing chiffon a twist of 3. The poorest wearing hose was a "dull twist" chiffon with a twist of 23. Moeller (10) believes that the tensile strength of a yarn is dependent upon the number of fibers in a cross section, and the twist of the yarn. If a yarn is twisted very little, the fibers slip past each other under strain and the tensile strength is reduced. When sufficient twist is given, the pressure of the outside fibers against the inner fibers is such that a slipping of the inner fibers becomes impossible. With too much twist, the yarn become brittle and the tensile strength is reduced. This danger is relatively greater in low count yarns than in fine count yarns, because the pressure of the outer against the

inner layers is comparatively smaller in the latter. Ordinarily the hand twisted yarns possess a higher tensile strength than soft twisted yarns, all other things being equal. The twist should not be any higher than the requirements and use of the yarn demand as far as strength is concerned. The twist limit is dependent on the elastic limit of the raw material used (10). The best wearing hose in the test had a yarn number of 49 and 7 twists per inch. Other hose with more or less twists per inch, did not wear so well. The best wearing chiffon hose had a yarn number of 61 with 3 twists per inch, while the poorest had a yarn number of 71 with 23 twists per inch. Another chiffon hose had a yarn number of 77 and 3 twists per inch, but wore almost four times as long.

The bursting strength varied with the size of the yarn, the heavier yarns bursting with about 143 pounds' pressure, the medium yarns with about 100 pounds and the fine yarns with about 75 pounds. The breaking or tensile strength also varied with the size of the yarn, being larger for large yarns and smaller for small yarns.

In the on-the-foot wearing test, the hose used ranked in the following way, according to hours of wear:

Rank	Brand of Hose	Ave. hours worn
1	Vb	313:25
2	IIb	233:25
3	Ib	224:40
4	IVb	219:45
5	IIIb	211:00
6	IIIa	208:45
7	VIIb	202:50
8	VIIb'	195:15
9	VIb	193:35
10	IVa	170:45
11	Ia	170:15
12	IIa	86:25
13	IIIa	46:15

Number Vb apparently surpassed the others in its hours of wear

on account of certain specifications that entered into its construction: - a large yarn size, number 49; a moderate twist of 7 per inch; the smallest number of fashion-marks in the leg; and an ankle that stretched 3.4 inches.

One hundred and ten pairs of the test hose out of 150 pairs tested were completely worn out. Three of those were discarded due to accidents and belonged to students. Two pairs were worn out from acid burns and one pair from a fall. Two of the experimental subjects (home-makers) did not wear out any of the five pairs allotted to them, while twelve wore out all of their pairs. The home-makers in the test and those walking on an average of four blocks a day outside the house and campus wore out the least number of pairs. Those walking the greatest number of blocks per day (30) wore out the greatest number of pairs during the test period.

Out of the 30 experimental subjects, 21 wore out hose most often from holes in the heel. This fact was also shown in the results from the interviews with women. Seven wore their hose out most frequently from runs in the leg.

Kind and condition of shoes made a difference in the way a few people wore out their hose but these factors were almost negligible, considering the group as a whole. In only three cases did the condition of the lining of the shoe effect wear on the hose.

The weights of the wearers had no relation whatever to the wear they gave the hose; however, those with large ankles wore out more pairs of hose than those with small ankles.

After carefully examining all the construction specifications

of the silk hose used in this study, and comparing them with their wearing records and the personal data of the large group of wearers; it is evident that from hose of certain specifications we can expect a certain number of hours of wear. Hosiery with a yarn number of about 49 and a twist of 7 should be worn about 250 hours before visible wear appears. This would amount to about 17 days of service. Hose with a yarn number of about 65 with a twist of 5 should give about 200 hours of wear, or 14 days. When the yarn number is about 75 and there are 2 or 3 twists per inch, approximately 180 hours or 12 days of wear may be expected. With a yarn number of 70 and about 18 twists to the inch, an average of 66 hours or 4 days may be anticipated.

SUMMARY

1. In this study fifteen stores were visited to find out what brands and weights of silk hosiery were carried in their stocks, and what factors influenced women's selection of silk hosiery.
2. Two hundred and fifty women including fifty-four students, twenty-five clerks and stenographers, twenty-nine teachers, one hundred town home-makers and forty two rural home-makers were interviewed to find out what influenced them in their selection of silk hosiery; their methods of caring for hosiery; and their opinions about the wearing qualities of silk hosiery.
3. Seven brands and thirteen kinds of silk hosiery that were generally worn by the women interviewed, were selected as material for this study.
4. Laboratory tests were conducted on these thirteen kinds of silk hosiery to determine their construction specifications.
5. On-the-foot wearing tests were carried on with these thirteen kinds of silk hosiery, using thirty experimental subjects who wore five pairs of silk hose each.
6. Complete records of the number of wearing hours for each pair of hose, the first appearance of visible wear, and personal data about the wearers were kept.
7. Hose were delivered and collected daily and were laundered after one wearing by a uniform standardized method.
8. The wearing time of each kind of silk hose was studied in connection with its construction specifications and the personal data of its

wearers.

9. Some of the construction factors show a definite relationship to the wearing qualities of silk hose.

10. The yarn number and twist of yarn appear to be the two outstanding factors affecting the wearing qualities of silk hose.

11. The size of ankle and the amount of walking are the two items in personal data that seem to have the greatest effect upon the wearing qualities of silk hose.

CONCLUSIONS.

1. Women are chiefly influenced in the selection of silk hose by its shape, appearance and wearing quality.
2. There is a general tendency for women to buy service weight silk hosiery rather than chiffon weight.
3. The majority of women launder their silk hose after one wearing, using tepid water and a mild soap.
4. A definite knowledge of construction specifications for silk hosiery is necessary in order that the consumer may judge its wearing qualities.
5. The yarn number and twist of the silk yarn used in manufacturing hosiery are the two outstanding construction factors affecting wearing quality.
6. The amount of walking done by the wearer is another factor that effects the length of life of silk hosiery.
7. The larger the size of ankle of the wearer the greater the number of pairs of hosiery worn out.

ACKNOWLEDGEMENTS

The writer wishes to acknowledge the courtesies shown her by the women interviewed; to extend special thanks to those who took part in the hosiery wearing test; and to express her appreciation for the assistance and guidance given her during this study by Doctor Jessie E. Richardson, of the Department of Home Economics of the Montana Experiment Station.

BIBLIOGRAPHY

1. Cook, Rosamond C.
1929. A Consumer Study of Hosiery Advertising. Jour. Home Ec. 21, 905

2. Trumbo, Grace
1926. A Comparison of the Wearing Quality of Silk and Rayon Hosiery. Master's Thesis, Iowa State College, Amess Iowa.

3. Holmes, Ruth M.
1929. Trends in Types of Hosiery Advertising. Master's Thesis. The University of Chicago, Chicago, Illinois.

4. ---- -----
1930. Results of Laboratory and "On-the-foot" Wear Tests of Dexdale "Silk-Sealed" Hosiery. Dexdale Hosiery Mills, Lansdale, Pa.

5. Bliss, Callie M.
1930. Clothing Expenditures of College Girls. Jour. Home Ec. 22, 663

6. ---- -----
1924. A Standardized Method of Measuring the Size of Hosiery. Cir. of Bur. of Standards, No. 149. Dept. of Commerce, Govt. Printing Office, Washington, D. C.

7. ---- -----
1930. Hidden Facts about Hosiery Quality. Trojan Hosiery Mills, Inc., 385 Fifth Ave., New York.

8. ---- -----
1930. A.S.T.M. Specifications and Methods of Tests for Textile Materials. Committee D-13 on Textile Materials, American Society for Testing Materials, Philadelphia, Pa.

9. Phelps, Ethel L.
1928. A Laboratory Manual for Advanced Courses in Textiles. Burgess-Roseberry Co., Minneapolis, Minn.

10. Moeller, E.
1929. Tensile Strength, Elasticity and Elongation in Yarns. The Melliand, 1, 10.