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UNITED STATES DEPARTMENT OF LABOR
Frances Perkins, *Secretary*
BUREAU OF LABOR STATISTICS
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Postwar Employment Prospects for Women in the Hosiery Industry

Bulletin No. 835

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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., May 22, 1945.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on postwar employment opportunities for women in various occupations in the hosiery industry. This is the second in a series of bulletins prepared in the Bureau's Occupational Outlook Division, based on studies of the outlook for employment in the various occupations and industries. This report was prepared by Arthur W. Frazer and Abraham Ringel.

A. F. HINRICHS, *Acting Commissioner.*

Hon. FRANCES PERKINS,
Secretary of Labor.

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Bulletin No. 835 of the

United States Bureau of Labor Statistics

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Postwar Employment Prospects for Women in the Hosiery Industry

Summary

Replacement of men by women workers during wartime occurred in the important occupations in both the full-fashioned and seamless branches of the hosiery industry. In the seamless-hosiery branch, which before the war employed proportionally more women than did the full-fashioned branch, the gains in number during the war were relatively greater because the principal occupations require less skill. In the manufacture of full-fashioned hosiery, some gains, however, have been made in the employment of women in such skilled occupations as knitting and topping. Considering mill experience and wartime preference, it appears that the gains made in the seamless mills stand a greater chance of persisting after the war. Technological developments in both branches of the industry, not fully effective before the war, will favor the continued trend toward greater use of women in some occupations but may eliminate some jobs in which women have been customarily employed.

The labor force of the hosiery industry consists mainly of women. In addition to the jobs which they have customarily held, women have made significant wartime gains in occupations in which men were formerly employed. The shortage of male workers first confronted the hosiery industry at the time when raw materials such as silk and nylon were no longer obtainable and the industry was attempting simultaneously to convert to the use of rayon and adjust the production levels to rationed supplies. In fact, the occurrence of temporary layoffs and fractional workweeks during this transition period accentuated the drift of workers—women as well as men—away from the hosiery industry. The number of workers in the industry dropped from 159,100 in 1939 to 128,500 in 1942.

By the time an operating balance between labor and raw material was achieved, the hosiery mills had lost many of their men, including some of their best workers. This drain of men continued. Hosiery manufacture was not considered an essential industry, and the men in hosiery mills were comparatively young; most of them were under 38 years of age. In higher-paying war jobs their previous experience and mechanical aptitude were a definite asset. Many of them went into service with the armed forces. Not only was it difficult to find men to replace them, but the mill managers were reluctant to expend the money and time required to train new men for skilled jobs when the likelihood of losing them, under wartime conditions, was so great. Among the expedients adopted by hosiery manufacturers was the

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employment of women, many of whom lacked previous industrial experience.[1] Job simplification and other techniques, aimed at the most efficient utilization of this new supply of labor, were introduced. The wartime experience in the mills and the opinions now generally prevalent as to the success with which women have adapted themselves to these occupations afford some indication of what may be expected after the war as regards relative employment opportunities for men and women in the hosiery industry.

The production of full-fashioned hosiery differs considerably from that of seamless hose, not only in the manufacturing processes and the products, but also in the machinery used and the degrees of skill involved. For these reasons, the two branches of the industry are here treated separately.

Trend of Employment of Women in the Industry

Within the past 20 years the proportion of women employed has increased in both full-fashioned and seamless hosiery manufacture, but the rate of increase began to level off prior to the war. In October 1942 female employment for both branches of the industry was 63 percent of total wage-earner employment—only 2 percent higher than in October 1939. By August 1944, however, women in the industry constituted 69 percent of the total number of workers employed. In the full-fashioned branch of the hosiery industry the proportion of women in the labor force rose from 57 percent of the total in 1939 to 63 percent in August 1944; in the seamless branch the increase was from 67 percent to 75 percent.

Full-Fashioned Hosiery Manufacture

COMPOSITION OF LABOR FORCE

In general, jobs in the full-fashioned branch of the hosiery industry demand a relatively high degree of operating skill. The machinery is complex and therefore requires close attention, manual dexterity, and mechanical aptitude on the part of its operators. A study made by the Bureau of Labor Statistics in 1938 [2] indicated that skilled workers accounted for 64 percent of the total labor force, as compared with 23 percent in the semiskilled and only 13 percent in the unskilled groups.

The importance of the major occupations in the total wage-earner employment of the 105 full-fashioned hosiery mills covered in that study is shown in the accompanying tabulation.

	Percent of total wage earners
Boarders	5. 2
Folders, wrappers, and boxers	3. 3
Inspectors and examiners	5. 7
Knitters	27. 7
Loopers	6. 1
Machine fixers	1. 0
Menders and seamers	11. 7
Pairers	3. 7
Toppers	15. 8
All other	19. 8

[1] Women workers who were new entrants into the labor force between December 1941 and March 1944 constituted 43 percent of all women in manufacturing at the latter date; more than half of this group had previously been home housekeepers. (See U. S. Women's Bureau Bulletin No. 20: Changes in Women's Employment During the War, Washington, 1944.)

[2] Earnings and Hours in the Hosiery Industry, 1938, by Jacob Perlman and H. E. Riley, in Monthly Labor Review, May and June 1939 (also reprinted as Serial No. R. 955).

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SKILLS REQUIRED

The skilled occupations are characterized, for the most part, by distinctly different aptitudes, some of which are most generally associated with men and others with women. Machine fixers must undergo long periods of mechanical training and first-hand experience on the complex knitting machines; men are more likely to possess the mechanical ability and other innate qualities which make for quick progress and highest efficiency. Men also appear to withstand better than women the heat, humidity, and heavy work in the dye house. On the other hand, women are preferred for those occupations which depend primarily on quickness of eye and manual dexterity. These include topping, which involves the transfer of the leg of the stocking, loop by loop, onto the needles of a transfer bar which is set on a "footer"; and the looping or joining together of the openings in the heel and in the toe after they have been set (loop by loop) on the needles of the looping machine. Sewing the seam down the back of the stocking, repairing, inspecting, and pairing all require careful and close attention, and women are customarily preferred for these jobs. Folding and boxing require few special aptitudes; men and women are equally efficient.

Job Requirements in Full-Fashioned Knitting

Knitting entails the operation of complicated and expensive power-driven machinery and the careful handling of easily damaged hose. It has been customary in most mills to employ two types of machines to produce the flat stocking—a "legger," which knits the leg of the stocking down to the ankle, and a "footer," which completes the knitting process. The operation of the machines requires the use of men with considerable mechanical abilities and more strength than women usually possess. "Legger" and "footer" knitters are highly skilled, and learners in the knitting trade at one time served a formal apprenticeship. Even though the apprentice system has been abandoned, a worker has not been considered a skilled knitter, capable of taking full responsibility for the job, until he has worked at least a year. Experienced knitters have been required to be thoroughly familiar with the design and function of the knitting machine and, in addition, to be able to make any necessary minor repairs and adjustments. Occasionally they are called on to make changes involving the patterns and sizes of the stocking. Considerable physical effort is necessary in starting the machine, particularly on older models, if it is stopped at a point of unbalance. Starting the machine is done by a handwheel and may be necessary three or four times during one cycle of operation. In addition, although the machine is automatic, the operator of a 30-section machine must care for and watch the knitting of 30 stockings; and the machine is so complex that a minor breakdown can result in expensive damage.

WOMEN IN FULL-FASHIONED KNITTING

Sources and utilization of labor.—Women were almost never used as knitters until mills were compelled to seek a solution to the problem of a rapidly disappearing force of male employees. Prior to the war, a few mills experimented with the use of women knitters, but there

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was no particular need to substitute women for men before the current manpower situation, and the techniques which were later introduced in order to utilize the capabilities of women knitters to best advantage were not attempted. The earlier experience of mills which had used women knitters was valuable later, but the practice did not become widespread so long as male labor was plentiful. In 1938, only 1.4 percent of the knitters in mills in the Bureau's survey were women.

The first women to be trained as knitters were taken from among the toppers. Because of their general familiarity with the knitting process, they were able to attain reasonable proficiency in the basic operation of the knitting machine within a few weeks. However, technological advancement, which during a period of 5 to 10 years before the war had brought about single-unit knitting, caused the displacement of large numbers of toppers and their disappearance from the hosiery industry. Topping also became one of the critical occupations in the industry because women who were adept at such work had begun to leave for war industries where their qualifications were especially useful on precision assembly work and jobs of similar character. Loopers, next preferred for training as knitters, were difficult to replace. Thus the industry was forced to rely, for its knitter learners, on women who came from jobs in the plant with no related experience or who were altogether new to hosiery production.

The hosiery manufacturers therefore attempted, by job simplification, to divide the knitting operation in such fashion that the remaining experienced knitters would be used most effectively and the new women knitters would not be pressed beyond their immediate capabilities. In the strictest sense, the latter group consisted of machine operators rather than knitters and normally took care of the thread supply, observed the proper functioning of the machine, removed the finished stockings, and attended to other similar details involved in the knitting process.

In most mills where women replaced men, the remaining experienced male knitters were utilized principally as group leaders, or supervisors, of three or four women operators, each attending one machine. In such cases, the skilled male knitter received either a weekly salary or wages based on the production of the knitters under him. If paid by the latter method, he sometimes operated his own machine, besides supervising others, and received, in addition to the regular piece rate for production on his own machine, a fractional piece rate for production from other machines under his supervision.

In only a few mills were women given complete responsibility for knitting, as the process requires technical supervision as well as some assistance on manual operations which are too strenuous for the average female worker. However, the newer machines installed in some mills reduce these disadvantages of the women workers. Thus the automatic welt turner, which turns the welt on all the stockings at one time in a few seconds, eliminates the time-consuming manual adjustments otherwise necessary on each individual stocking. One employer, operating a mill with modern single-unit machines equipped with automatic welt turners, reports that the satisfactory performance of his all-women knitting department is due primarily to this innovation.

In one group of mills, the male knitters were transferred from one plant to another, leaving only a skeleton crew of 4 male knitters to

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supervise the 24 women on knitting machines. Wholesale transfer of workers in all other occupations in the mill resulted in a labor force which was 97 percent women. In another mill equipped with conventional leggers and no automatic welt turners, the majority of the knitters were still male, but the proportion of women on knitting machines was increasing. In still another, where only male knitters were used formerly, 11 girl knitters, comprising about two-thirds of the total knitting force, were employed.

Relative efficiency of women.—In the early months of the war women knitters were generally reported to be satisfactory, but there were some exceptions.[3] In a few mills employment of women was tried but later abandoned; in most of these, however, the knitting equipment was old and not suitable for operation by women. Some early reports indicated that the percentage of successful knitters from a group of learners was lower among women than men and that two women learners had to be recruited to obtain one satisfactory knitter. Although this ratio was higher than the proportion of learners usually needed to train a given number of successful knitters, it did not reflect inability of women to develop into efficient knitters, since many of the learners became dissatisfied with the type of work when the initial appeal diminished, and others, as was common in all industries early in the war, moved on to other jobs.

Reports have indicated generally that productivity was reduced from 10 to 20 percent with the use of female knitters. Such reports, however, should be used cautiously in drawing conclusions regarding the comparative efficiency of male and female knitters. Very few male knitter learners were used, and differences in the productivity of men and women knitters with equal work experience were not determinable. Moreover, with job simplification, the duties were divided and the production and maintenance of a knitting machine therefore did not represent the exclusive time and effort of the operator alone. It is known, however, that the differences in productivity were appreciable.

In one mill, women operators at the end of 2 months were producing about 50 percent as much as male knitters. In another, men produced from 14 to 15 dozen pairs of hose per machine in 8 hours, as against between 8 and 9 dozen pairs for women operators with 5 or 6 months' experience. Still another mill reported that female knitters produced between 10 and 11 dozen pairs of hose in 8 hours on a 24-section machine, as compared to 12 to 13 dozen pairs for male knitters. Local conditions, types of machines, previous experience, and individual aptitudes of women knitters accounted for these large variations. The last-mentioned mill, with the highest comparative efficiency, drew heavily from workers with previous hosiery-mill experience, several of whom were former toppers.

Relative incidence of women workers.—Although it is impossible to make a general estimate of the number of women knitters who came into the industry during the war, it is evident that the proportion of women in this occupation is now substantially higher than the 1.4 percent reported in 1938. Reports from selected areas, based on

[3] Information in this section is based on a field survey of the hosiery industry by the Bureau in 1942, supplemented with information obtained in 1944 from firms in the industry, the National Association of Hosiery Manufacturers, and the American Federation of Hosiery Workers.

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surveys by the Bureau's Wage Analysis Division, indicate that in 117 full-fashioned hosiery mills approximately 7 percent of the knitters in 1943 were women. In the South, approximately 13 percent of all knitters were women, which suggests that southern mills with their newer machines found the use of female knitters more practicable.

Employment outlook.—Even where the use of women knitters has proved satisfactory, mill owners generally continue to indicate a preference for men in this occupation. The trend towards faster and more complicated knitting machines is evident in each new model manufactured. Improved machines are more automatic and hence require fewer manual duties; at the same time, the complexity of such machines necessitates the continual attention of a highly experienced knitter, able to understand the functioning of the machine and make any minor repairs and adjustments that may be necessary. This need for continual attention is likewise essential on the great amount of old and obsolete machinery which can be modernized by the addition of attachments. Job simplification, adopted to facilitate the employment of women, has many operating disadvantages, and the mills naturally prefer workers who can be assigned complete responsibility for the entire process and related duties. Men not only have the mechanical aptitude and greater strength that the process requires, but also are more likely to make it a lifetime trade. Under normal conditions most employers would hesitate to incur the expense of training a young woman knitter and assume the risk of having her quit because of marriage or other reasons just as she attains a high degree of proficiency. Such expense, in addition to wages, includes the cost of raw materials wasted in the manufacture of unsalable hosiery as well as the unproductive use of costly machinery.

Recently, the trend in the substitution of women knitters has slackened for several reasons. The manpower situation has eased somewhat since men over 30 are no longer generally being inducted into the Army and Navy, and in addition, a few of the knitters who left the industry have returned to their former occupations. Many mills still employ women on their knitting machines, but the preference for male knitters is almost universal, and it is indicated that, once ample labor supplies are available, mills will revert to the use of men.

WOMEN IN BOARDING OPERATIONS

Women have proved to be quite efficient in the performance of the boarding operation, which consists of drying and shaping the wet stockings on wooden or metal forms. Indeed, some mills have employed women boarders for several years. In 1938, about half of all boarders in the full-fashioned hosiery mills were women. However, women were not generally attracted to this occupation or encouraged to enter it because of the high temperature and excessive humidity caused by heat and steam from the boarding forms or the drying cabinets. Since the war, mills have used women in greater numbers and many prefer them to men as boarders, because their softer hands and greater manual dexterity cause less damage to hosiery. Rayon hose are comparatively weak when damp, and their manufacture necessitated greater attention to problems in the boarding department. Manicuring service and rules restricting the wearing of hand

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and arm jewelry have been introduced in an effort further to reduce the amount of hosiery pulled or snagged during the boarding process.

No substantial increase in the proportion of women in boarding has occurred during the war.[4] Where women have been used, the consensus of opinion is in their favor, and in many cases they have been found more satisfactory than men.

Unlike the situation in knitting, a continuation of the employment of women in boarding is virtually assured. Many mills now indicate a desire to hire only women in their boarding departments. It is likely that boarding will offer the biggest opportunity of any of the occupations in full-fashioned mills for greater proportions of female employment, particularly if the unpleasant conditions resulting from excessive heat and humidity are ameliorated.

WOMEN IN OTHER OCCUPATIONS

The proportion of women employed in most other occupations in full-fashioned hosiery mills was quite high, even before the current labor situation developed. In topping, which before World War I was popularly considered a man's job, 93 percent of the jobs were filled by women in 1938, and by 1943 men had entirely disappeared from this occupation. Loopers, inspectors and examiners, pairers, and menders and seamers are occupations in which women have filled virtually 100 percent of the jobs for many years. In such unskilled jobs as those of folders, wrappers, boxers, stampers, and labelers, women have likewise been used exclusively. Obviously, postwar conditions will not affect the employment of women in these jobs, on which their use has proved an advantage.

On the other hand, despite wartime losses of skilled men difficult to replace under the circumstances, mills have not begun to employ women in such highly technical jobs as machine fixing nor for work in the dye house where conditions are usually unpleasant. Moreover, it is highly improbable that women will replace men in such jobs after the war.

Seamless-Hosiery Manufacture

COMPOSITION OF LABOR FORCE

The Bureau's 1938 study already mentioned revealed that in the seamless-hosiery mills only 6 percent of the workers (as contrasted with 64 percent in full-fashioned hosiery mills) were classified as skilled, 73 percent (as against 23 percent) were semiskilled, and 21 percent (as against 13 percent) were unskilled. These data indicate the substantially lower skill level of the seamless branch.

Of the 6 percent in the skilled class, about 5 percent were machine fixers (an exclusively male occupation); the other 1 percent consisted of foremen and miscellaneous nonproduction workers. Among the semiskilled workers the largest groups were, in order, the knitting occupations and loopers.

[4] Data from the wage report on Full-Fashioned and Seamless Hosiery for Eight Southeastern Labor Market Areas, by the Bureau's Regional Office at Atlanta, July 1943, and from unpublished material in the Wage Analysis Division, indicate that 53 percent of the boarders in full-fashioned mills in 1943 were women.

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The relative importance of the major occupations in the 97 seamless-hosiery mills covered in the 1938 study are shown below:

	Percent of total wage earners
Boarders	7.8
Clippers	2.7
Folders, wrappers, and boxers	3.2
Knitters	24.0
Automatic	4.0
Rib	1.5
String	2.3
Transfer	16.2
Loopers	19.0
Machine fixers	4.8
Menders and seamers	6.8
Pairers	3.8
All other	27.9

SKILLS REQUIRED

The greater prevalence of female workers is directly related to the nature and skill level of the occupations in the seamless mills. In the prewar period the seamless-hosiery mills utilized larger proportions of women workers than did the full-fashioned hosiery mills; differences have been even greater during the war. The employment of women in the seamless branch of the industry rose from 67 percent in 1939 to 75 percent in August 1944, an 8-point increase as compared to a 6-point rise (from 57 to 63 percent) in the full-fashioned branch. In 1938, 79 percent of all unskilled workers in seamless-hosiery mills and 73 percent of the semiskilled, were women; women constituted only a negligible proportion of the workers in the skilled jobs.

In the seamless-hosiery manufacture, the occupational requirements involve not only less mechanical ability, but less technical experience such as is accumulated over a relatively long period. Seamless-hosiery machinery is much simpler in design and function, the jobs are generally more operative in nature, and the operations (even though they may not differ in repetitive character from those in full-fashioned mills) are such that manual dexterity, limited mechanical skill, and the ability to perform a number of relatively simple tasks are of greatest importance.

Job Requirements in Seamless Knitting

The training period required for seamless knitting, in contrast to that in full-fashioned, is comparatively short, and the operators are considered to be semiskilled. The seamless knitting machines are highly automatic in operation, yet simple in design. Seamless hosiery is less complex than full-fashioned hosiery in its construction, and although different kinds of men's socks or women's seamless hose are produced on different types of machines, their knitting requires relatively little skill and on most machines demands only intermittent attention. The duties of the seamless knitter include keeping the set of machines supplied with yarn, tying broken ends, and removing finished hose. If the machines are not completely automatic, the knitter must also transfer the rib tops, by means of a transfer ring, to each of the knitting machines to knit the foot.

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Types of machines used.—Because of some variation in the skills required for operation and because of differences in the kind and quality of hose produced, knitting machines may be classified into three major groups.[5]

The first group consists of hand-transfer machines, usually grouped in sets of four or five machines, called "footers." The ribbed top (or welt) of the hose is knit in tubular form on a separate rib machine and is transferred by the knitter, link by link, onto the needles of a circular ring which is subsequently placed on the "footer" to complete the remainder of the stocking. Once the machine has finished a sock, it stops and remains idle until the sock is removed and another circular ring, to which the rib top has been transferred, is set into place.

The second group consists of automatic machines which run on a continuous-knit principle, making the complete sock, including the rib and toe, and beginning another without interruption. Because of the continuous-knit principle and the minimum attention required, a single operator can handle a larger number of such machines. The number of machines per set and their speed and complexity are determined by the type of hose they are built to knit. The number per set may vary widely, but averages about 20 machines.[6] Automatic machines are of wide variety. Plain colors, spirals, wraps, reverse plaiting, English rib, mock rib, and fancy link patterns all require machines of different construction. The knitter capable of knitting hose on one type of machine may require retraining and experience on another model before he understands the mechanical details and becomes proficient in its operation.

The third group is composed of hand-transfer machines which have been converted to automatic operation by the addition of a so-called "elastic attachment." The conversion is comparatively simple and inexpensive, and the elastic attachment makes unnecessary the separate rib knitting and the hand-transfer process. Machines so converted must use elastic, or rubberized yarn, in the rib of the socks. With this exception, the product and process are similar to those of the conventional automatic machines. Such converted machines are grouped in sets at least as large as those of the conventional automatic machines and may be even larger, because the converted machines were originally designed to knit simple patterns and therefore require less attention.

Use and effect of elastic attachments.—Elastic attachments were adopted principally as an expedient for modernizing obsolescent machinery and reducing labor costs. Unit labor requirements and costs for the production of hand-transfer hose were high. In contrast to the 20 to 30 converted transfer machines usually attended by one operator, one knitter could operate only 4 to 5 hand-transfer knitting machines. On a set of conventional automatic, or converted transfer machines, the operator in 8 hours could produce 80 to 95 dozen pairs of hose; on a set of hand-transfer machines, designed to produce hose of similar pattern, the knitter averaged only 14 to 18 dozen pairs and this did not take into consideration the labor required for rib knitting and pulling.

[5] Such machines are grouped into sets, each set requiring one knitter operator.

[6] The Scott and Williams "H H", Reverse Plait, and "K" and "R I" models may run as high as 25 to 30 machines per operator. The more complicated Komet and Links and Links models generally are placed in sets of 10 machines.

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The popularity of men's hose with elastic tops became so great that many of the conventional automatic machines were "converted" to the production of such goods by means of elastic attachments. A survey of 49 mills by the Bureau of Labor Statistics in 1942 indicated that, of the total 17,000 knitting machines in the seamless-hosiery mills, 3,000 were equipped with elastic attachments and a third of the latter had been conventional automatic machines.

Following the freezing of rubberized yarn in 1942, the conventional automatic machines reverted to the production of the customary automatic (rib-top) hose. Most of the hand-transfer machines with elastic attachments were put back on hand-transfer work or retired from production. A few undertook the production of socks with "victory tops," or simulated rib. A spot survey in 1942 of 22 seamless mills with 6,000 machines showed that they had 3,500 hand-transfer machines in operation before the rubber freeze; of these, 1,800 were producing elastic-top hose and 1,700 were on hand-transfer operations. After the rubber freeze, 2,300 machines were on hand-transfer work, an increase of 600. Of the remainder, 400 had been put on the production of hose with victory tops, and 800 had become at least temporarily idle, because some mills hesitated to engage in the higher-cost production of hand-transferred hose or were unable to recruit transfer knitters to operate the machines.

WOMEN IN SEAMLESS KNITTING

In 1938, women held 67 percent of the jobs on knitting machines in seamless mills, as compared to 1 percent in full-fashioned mills. Women knitters had increased to 74 percent by 1943, but the proportion of women varied considerably from mill to mill, depending on the type of knitting performed or even on the model of the machines in use.

As early as 1938, 88 percent of the knitter operators on hand-transfer machines were women, for their manual dexterity made them particularly adaptable to hand-transfer knitting. Moreover, the job largely involved a short cycle of highly repetitive tasks. The introduction and widespread adoption of cheaper elastic-top knitting, which was doubtless stimulated by the minimum wages under the Fair Labor Standards Act, caused a marked decline in the use of transfer knitters. A comparison between 1938 and 1940 in 87 seamless-hosiery mills shows that the operation of machines on transfer top, string work, and rib knitting decreased 23 percent, and that automatic and converted transfer knitting increased 19 percent. In addition, there were less than half as many transfer-knitter learners in 1940 as in 1938. Further indication of the technological displacement of transfer knitters is shown by the fact that the employment of all knitters declined approximately 15 percent, although total employment in the 87 identical mills in 1940 was only 3.3 percent less than in 1938.[7]

The freezing of rubber encouraged the return of hand-transfer hosiery and, with it, the use of women transfer knitters. The gradual disappearance of men from this occupation has been accelerated by wartime conditions. By 1943, less than 5 percent of such knitters were men.[8]

[7] Data are from the mimeographed report Earnings in the Seamless Hosiery Industry, 1940, prepared in the Bureau's Wage Analysis Division, April 1941.

[8] Significantly, the substitution of women for men in transfer knitting gained its first impetus in World War I. The manpower situation during the current war appears to have completed the shift of the occupation from men to women.

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Employment outlook.—It is evident that the proportion of women is quite unlikely to decline in transfer knitting after the war, but the proportion of women in seamless knitting generally may depend on the extent to which hand-transferred hose are produced.

The situation as regards employment of women on converted knitting machines, equipped to produce hose with elastic tops, is less clear. Many mills, as they added elastic attachments to their old machines, retained their women transfer knitters and used them as knitters on the converted machines. With the increase in the size of the set from 5 to 25 (or more) machines, the character of the work changed completely. The knitters were no longer operators with a strict cycle of duties, but became responsible primarily for vigilance in seeing that all machines were knitting properly, in supplying them with yarn, etc. Although the ability to make minor repairs was a desirable attribute, the converted machines were almost universally of comparatively simple design and, despite their age, required only occasional attention.

There has been no wartime experience in the employment of women knitters on elastic-top hose upon which assumptions regarding the character of postwar employment may be predicated. The generally satisfactory experience of mills with the use of women prior to the freezing of rubberized yarns suggests, however, that they may be used more widely. An added advantage stems from the fact that experienced workers will be immediately available from among the transfer knitters when mills reconvert their knitting machines.

Women had been used to some degree on the conventional automatic knitting machines. By 1938, about a fifth of such knitters were women, but their employment was generally restricted to models which were less complex in design and operation. Since this group of automatic machines includes the latest and most complicated models, it is not surprising that their prewar employment included the smallest proportion of women. The loss of male labor resulted in the greater utilization of women on such machines, as on the others, and by 1943 slightly over half of the knitters on automatic machines were women. Nevertheless, although there may be some partial retention of the wartime gains, the employers' preference for male knitters on this type of knitting machines will have noticeable effects on the proportion of women employed.

Finally, another important consideration in the future employment of women in knitting is the postwar promotion of 400-needle, seamless, "bare-leg" stockings. Interest in the manufacture of these stockings was aroused prior to the war because of the form-setting qualities of nylon. The machines on which the bare-leg stockings are knit are automatic and knit the complete stocking in one continuous process, beginning another cycle without interruption or attention. They were tentatively grouped in sets of 20 to 30 machines.

The war and the resultant loss of nylon for civilian use in 1942 cut short the manufacture of nylon bare-leg hosiery almost before it emerged from the experimental stage. Here, also, technical knowledge and the aptitude for mechanics may be the determining factor in the job qualifications for the operation of the new machines, and it is most likely that men will be employed. If seamless nylons meet with the popular acceptance and demand that many expect, a resultant boom in employment in seamless-hosiery mills may be

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reasonably expected. Such a development would result in the employment of a greater number of women for other occupations, even if they are not utilized on the 400-needle machines in the knitting department.

WOMEN IN BOARDING OPERATIONS

Boarders constitute about 8 percent of the total workers in seamless-hosiery mills. The hose handled by boarders in these mills are heavier than the sheer full-fashioned hosiery, and thus do not require the same degree of care in handling to avoid damage. Heated metal forms, rather than wooden forms and drying cabinets, are predominantly used in seamless-hosiery mills, and the danger of skin burns is somewhat greater. Otherwise the occupations in seamless and full-fashioned mills are comparable. Nevertheless, before the war, women constituted only 15 percent of the boarders in seamless-hosiery mills, as against about 50 percent in the full-fashioned hosiery mills.

Early in the war some seamless-hosiery mills attempted to replace their losses in the boarding department with 17- and 18-year old boys, but the lowering of the draft age made this plan impracticable. By 1943, the proportion of women boarders was 36 percent, or more than double that in 1938. The wartime gains of women in this occupation suggest that the previous hesitancy to use them stemmed from inertia rather than from proved impracticability. It is believed that boarding will present employment opportunities for women, although postwar increases in the employment of women boarders will not compare with those made during the war. It is possible that some women may be transferred to the boarding department from the knitting occupations, as servicemen return to their former occupations in the knitting department.

WOMEN IN OTHER OCCUPATIONS

Elsewhere in the seamless-hosiery mills, the proportion of women employed has increased to a point which amounts virtually to their exclusive use. Looping, pairing, seaming, mending, and inspecting have long been considered entirely women's jobs, and no change is anticipated. In miscellaneous occupations the wartime increases in women workers are accentuations of earlier trends.

The only jobs in which women have not replaced men to any degree are machine fixers and helpers, and dye-house employees. The possibility of the utilization of women in these occupations is remote.

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