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Chapter 9

Textile Products

THE textile products group includes all manufacturing industries whose chief materials are animal and vegetable fibers or fiber products; to these we have added industries engaged in the processing of furs. The manufacture of rayon yarn from cotton and wood pulp is treated as a chemical process and is therefore classified in the chemical products group. The activities covered by the textile group include preparation of fibers; spinning of yarns; weaving, knitting, or braiding of yarns into cloth, finished garments or other products; cutting and sewing of garments from woven or knitted fabrics; and processing of embroideries, artificial leather, oilcloth, linoleum, and the like. While most of the products are eventually transformed into articles of apparel, other important articles are used for furnishings (carpets, rugs, upholstery materials and curtains), wrapping materials (bags and twine), and industrial materials (tire fabrics, belting and cordage).

TRENDS IN THE PHYSICAL OUTPUT OF THE TEXTILE PRODUCTS INDUSTRIES

During the greater part of the period 1899–1937 the textile manufacturing industries, measured in terms of value added, constituted the most important manufacturing group. It is fortunate, therefore, that the data on physical output for this group are fairly extensive. Complete data on the physical output of textile products are available for most of the less advanced stages of production; and the final stages of

manufacture are covered in the most recent period (Table 23, Chart 11).[1]

Cotton Goods, an industry which surpasses all the others in the group with respect to value added, includes establishments engaged in weaving broad cotton goods from yarn either made in the same establishments or purchased; in producing cotton felts; and in spinning yarns and thread for sale. The physical output of the industry doubled in the years 1899–1937. Most of the rise occurred in the first decade, when output rose 38 percent. From 1909 to 1919 output increased only 15 percent, slightly less rapidly than population. In the next decade there was a rise of 28 percent, and in the last period a decline of 1 percent. The peak was reached in 1927, with output 4 percent above that of 1929.

There were significant changes also in the composition of the output of the cotton goods industry. During the first 20 years, when total output rose 60 percent, napped fabrics and twine remained practically unchanged; the combined output of sheetings, shirtings and muslin increased only 14 percent; and waste rose only 16 percent.[2] Plushes and corduroys, however, went up by 400 percent. In the years 1919–37 total output rose 27 percent, yet declines are recorded for the output of numbered duck (—30 percent), drills (—10 percent), muslins (—51 percent), twills and sateens (—22 percent), yarns for sale (—13 percent),[3] and denims, including pin checks, tickings and ginghams (—46 percent). In contrast

[1] Between 1933 and 1935, and between 1935 and 1937, considerable revisions were made by the Census in the classification of textile establishments. As a result, the changes in output noted in Table 23 are somewhat inaccurate for silk and rayon goods, carpets and rugs, men's clothing, textile gloves, elastic woven goods, cloth hats, knit hosiery, and men's shirts and collars. These errors are presumably minor, though no exact information is available. Details concerning these changes in classification are to be found in the footnotes in Appendix C. For the group as a whole the errors tend to cancel out; the group index is therefore only slightly affected by these shifts.

[2] The sale of waste and yarns to other establishments in the industry results in some duplication in the industry's output. This does not appear to be serious; see Appendix B.

[3] See footnote 2.

TABLE 23

TEXTILE PRODUCTS[a]

Physical Output: Indexes and Percentage Changes[b]

			Woolen and Worsted Goods				*Knit Goods*				
	Cotton Goods	*Lace Goods*	Total	Woolen Goods	Worsted Goods	*Silk and Rayon Goods*	Total	Hosiery, Knit	Underwear, Knit	Outerwear, Knit	Cloth, Knit
YEAR					INDEX OF PHYSICAL OUTPUT (1929:100)						
1899	49	..	71	..	..	22	19	8.8	67	24	8.9
1904	54	..	86	..	..	30	24	13	74	32	12
1909	68	..	103	78	123	40	33	19	95	59	7.5
1914	73	74	102	83	118	49	45	34	103	57	13
1919	78	87	98	92	104	64	55	43	109	61	38
1921	70	67	93	80	105	58	59	47	90	84	57
1923	93	101	120	115	130	73	75	57	103	119	58
1925	93	90	108	112	106	86	77	68	107	85	64
1927	104	96	103	105	103	92	83	78	102	84	74
1929	100	100	100	100	100	100	100	100	100	100	100
1931	78	80	81	70	88	92	92	88	78	108	148
1933	87	..	87	..	..	84	100	92	98	119	..
1935	78	143	116	..	..	133	111	102	99	142	..
1937	99	154	114	..	..	135	116	115	102	117	..
PERIOD					NET PERCENTAGE CHANGE IN PHYSICAL OUTPUT						
1899–1937	+101	..	+60	..	..	+512	+505	+1,202	+52	+393	..
1899–1909	+38	..	+44	..	..	+79	+73	+117	+42	+148	−16
1909–1919	+15	..	−5	+18	−15	+61	+67	+125	+14	+3	+402
1919–1929	+28	+15	+3	+9	−4	+57	+80	+133	−8	+65	+165
1929–1937	−1	+54	+14	..	..	+35	+16	+15	+2	+17	..

For footnotes see end of table, p. 171.

TABLE 23 (concluded)

	Carpets and Rugs, Wool	*Asphalted-Felt-Base Floor Covering*	*Linoleum*	*Cordage and Twine*	*Jute Goods*	*Linen Goods*	*Clothing, Men's*[c]	*Gloves, Textile, n.e.m.*[d]	*Shirts and Collars, Men's*	*Clothing, Women's, n.e.c.*[e]	*Corsets*
YEAR					INDEX OF PHYSICAL OUTPUT (1929:100)						
1899	61	..	..	67	61	137	..	..	..	..	..
1904	65	..	32	..	..	..	..	..	..	..	..
1909	78	..	59	82	109	200	..	..	..	..	..
1914	71	..	83	98	138	192	..	..	..	..	..
1919	62	23	66	93	117	86	..	..	..	..	..
1921	59	24	82	75	77	72	..	..	..	..	..
1923	101	56	99	96	104	125	..	..	..	..	..
1925	96	74	86	95	105	117	..	..	..	..	..
1927	89	105	92	95	97	120	96	104	101	84	99
1929	100	100	100	100	100	100	100	100	100	100	100
1931	63	78	45	69	79	68	75	67	99	103	111
1933	61	84	42	71	89	72	79	..	79	91	109
1935	86	113	60	72	100	73	100	61	91	109	..
1937	92	144	83	92	143	77	99	97	93	125	129
PERIOD					NET PERCENTAGE CHANGE IN PHYSICAL OUTPUT						
1899–1937	+52	..	..	+38	+134	−44	..	..	..	..	..
1899–1909	+29	..	..	+23	+78	+46	..	..	..	..	..
1909–1919	−21	..	+14	+13	+7	−57	..	..	..	..	..
1919–1929	+62	+332	+50	+8	−14	+16	..	..	..	..	..
1929–1937	−8	+44	−17	−8	+43	−23	−1	−3	−7	+25	+29

	Handkerchiefs	Elastic Woven Goods, n.e.m.[d]	Hats, Fur-Felt	Hats, Cloth	Hats, Straw, Men's	Hats, Wool-Felt	Artificial Leather	Oilcloth	Wool Shoddy	Total	
										Unadjusted	Adjusted
YEAR	INDEX OF PHYSICAL OUTPUT (1929:100)										
1899	..	..	79	..	..	135	..	..	55	43	38
1904	..	..	106	..	..	68	..	36	75	50	48
1909	..	..	126	..	..	101	..	62	68	64	60
1914	..	..	91	..	..	64	..	61	82	72	72
1919	..	..	94	..	..	79	..	38	98	75	67
1921	..	..	81	..	..	50	..	46	46	69	64
1923	..	..	93	..	..	72	102	61	100	91	82
1925	..	..	86	..	..	73	109	66	110	91	86
1927	99	76	104	97	122	87	104	79	71	94	94
1929	100	100	100	100	100	100	100	100	100	100	100
1931	75	62	78	59	99	84	59	77	59	85	87
1933	..	..	..	..	..	..	..	..	87	86	85
1935	78	69	94	71	143	185	91	76	109	101	99
1937	86	63	100	53	158	256	118	66	118	110	106
PERIOD	NET PERCENTAGE CHANGE IN PHYSICAL OUTPUT										
1899–1937	..	..	+26	..	..	+90	..	..	+116	+153	+180
1899–1909	..	..	+59	..	..	−25	..	..	+24	+47	+60
1909–1919	..	..	−25	..	..	−21	..	−39	+44	+17	+11
1919–1929	..	..	+6	..	..	+26	..	+163	+2	+34	+49
1929–1937	−14	−37	0	−47	+58	+156	+18	−34	+18	+10	+6

[a] Industries for which there are no adequate quantity data for any period listed above are: cotton small wares; haircloth; wool pulling; wool scouring; dyeing and finishing; carpets and rugs, rag; mats and matting; furnishings, men's, not elsewhere classified; embroideries, millinery and trimmings; hat and cap materials; fur goods; furs, dressed; awnings; bags, textile, not elsewhere made; belting, woven, not elsewhere made; house furnishings, not elsewhere classified; horse blankets; felt goods; flags and banners; regalia; nets and seines; upholstering materials, not elsewhere classified; and waste. These industries are covered by the adjusted total.

[b] The indexes have been constructed from basic data in the U. S. Census of Manufactures by methods described briefly in Chapter 2 and in detail in Appendix A. Appendix B presents these data, together with the indexes derived from them. The indexes cited here for individual industries have been adjusted to take account of changes in the coverage of the respective samples, except when such adjustment was impossible.

The percentage changes are not always entirely consistent with the indexes given above because the changes were computed from the indexes in Appendix B, which are carried to one decimal place.

[c] Includes clothing, men's, work; clothing, men's, n.e.c.; clothing, men's, buttonholes; and cloth sponging and refinishing.

[d] N.e.m. denotes not elsewhere made.

[e] N.e.c. denotes not elsewhere classified.

Chart 11

TEXTILE PRODUCTS

Indexes of Physical Output

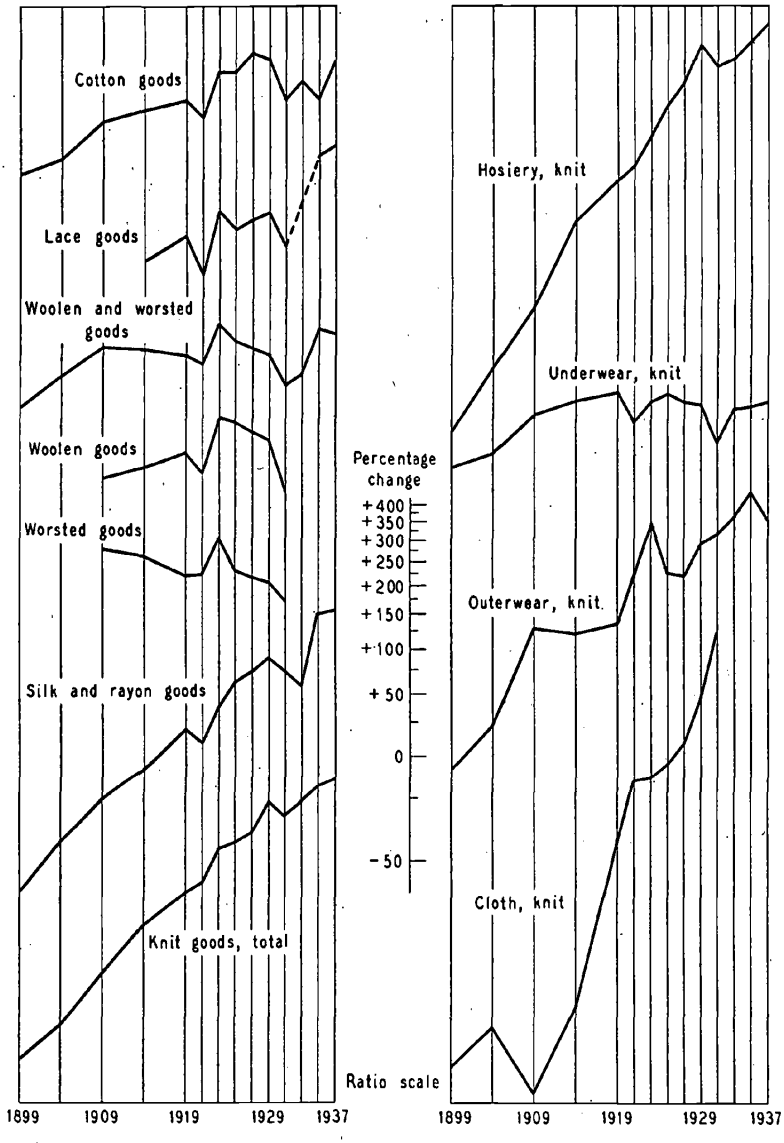


Chart 11 (cont.)

TEXTILE PRODUCTS

Indexes of Physical Output

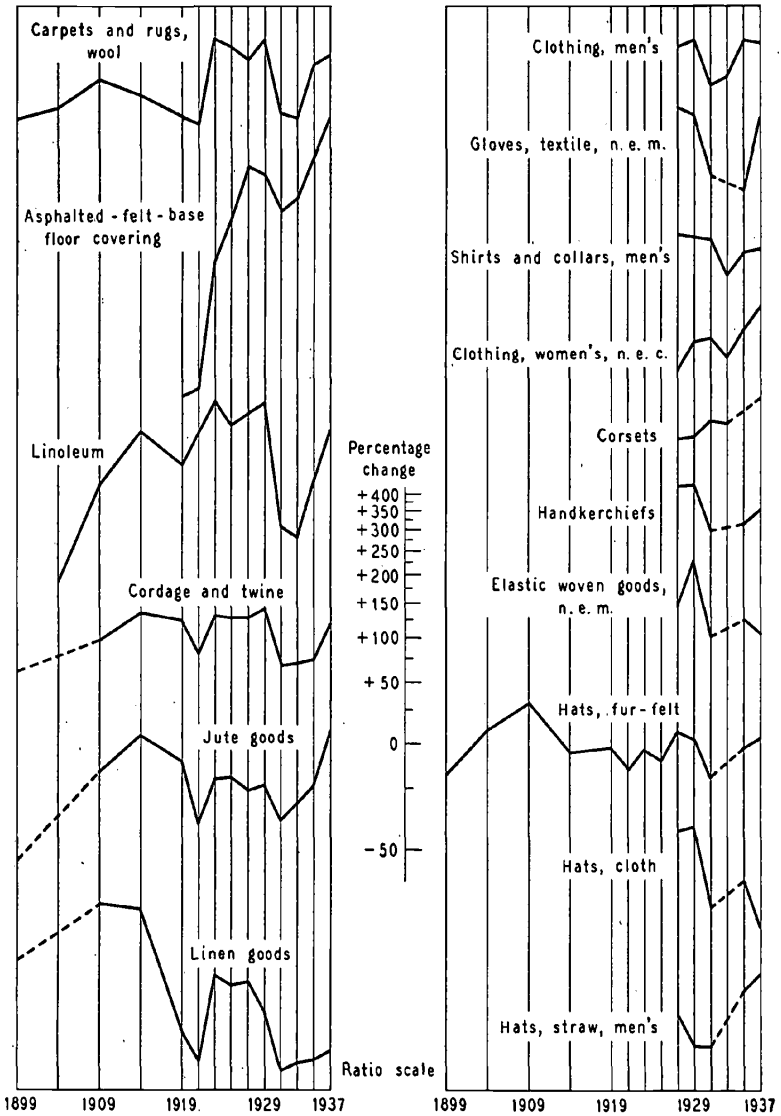
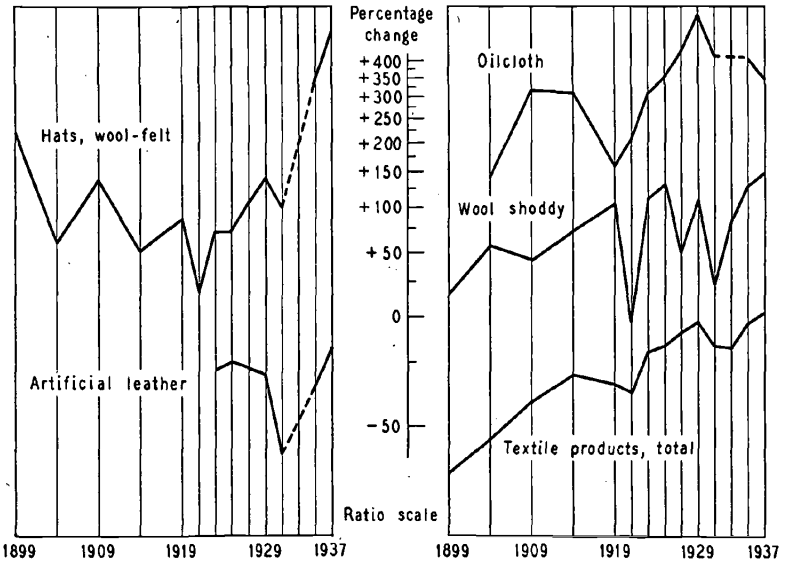


Chart 11 (concl.)
TEXTILE PRODUCTS
Indexes of Physical Output



there were large increases in the physical output of print cloth (+112 percent), cottonades (+183 percent), towelings (+168 percent), and tobacco cloth (+275 percent).

While the various types of cotton cloth changed in relative importance there was no significant net shift to the more expensive types. Thus our index of physical output of cotton textiles, in which the expensive types weigh more heavily than the less expensive types, rises only a little more rapidly (not more than about 5 or 10 percent in 38 years) than an index computed by the simple aggregation of all types in terms of square yards. There is supporting evidence, in respect of one quality characteristic, in the Census data on the fineness of the yarn used in cotton textile manufacture. Coarse yarns, with a count of 20 and under,[4] accounted for

[4] The count is expressed in terms of number of hanks containing 840 yards each, per pound of yarn.

57.9 percent of all cotton yarns produced for consumption and sale in 1899, 47.8 in 1919 and 55.2 in 1937; medium yarns (21's to 40's) for 36.8 percent in 1899, 45.3 in 1919 and 38.3 in 1937; and fine yarns (61's and over) for 5.3, 6.9, and 6.5 percent in the three years, respectively. Although the average quality of cotton goods produced was not affected by marked changes in the relative proportions of expensive and cheap varieties, the quality of each type of cloth was raised as a result of improvements in the manufacturing process.[5]

Woolen and Worsted Goods. This classification comprises woven fabrics, blankets and other products made from purchased or transferred woolen and worsted yarns or from the original raw wool, and yarns produced for sale or transfer. The output of this industry rose only 60 percent between 1899 and 1937, less rapidly than population.[6] Most of the rise occurred in the first decade, when output went up 44 percent. In the following two decades there were only minor net changes, but in the last period output rose 14 percent. The peak in the series came in 1923, when output was about 5 percent above the level it was to reach 14 years later, in 1937.

The woolen and worsted goods industry turns out an enormous variety of fabrics. These differ from one another not only with respect to the basic fiber and type of yarn—e.g., all-wool cloth, made of worsted yarn, woolen yarn, or a combination of both types of yarn; woolen- or worsted-

[5] "For example, the 64 × 60 print cloth produced today under conditions of controlled humidity, with feeler motion and on automatic looms, is definitely superior to that sold twenty-five years ago. Weak spots have been reduced through far greater uniformity in the yarns." *Textile Markets,* Report of the Committee on Textile Price Research to the Conference on Price Research (National Bureau of Economic Research, Price Studies No. 2, 1939), p. 92.

[6] Even 60 percent is a slight overstatement, because there was an increase in the amount of duplication in the total product of the industry made from yarns originating in the industry and sold to other establishments within the same classification.

filled cloth, made with warp yarns of cotton, rayon, etc.—but also with respect to purpose—e.g., men's suitings, men's overcoatings, shirtings, etc. Unfortunately, continuous data on the output of individual products are not given in the Census reports. It is possible to distinguish only between woolen and worsted goods, and even this breakdown applies only to the two middle decades. These limited data show increases, from 1909 to 1919, and from 1919 to 1929, in the output of woolen fabrics made of rough fleecy yarns spun from carded short-staple wool; and decreases in the output of worsted fabrics made of smooth-surfaced yarns spun from combed long-staple wool. We know also that there have been changes in the weight per unit of area in wool fabrics: men's suitings in 1932 weighed 8 to 12 ounces per square yard, whereas a few years earlier they weighed 12 to 16 ounces. Similarly, men's overcoatings, which formerly ran from 16 to 20 ounces, in 1932 seldom weighed over 16 and more often were as low as 12 ounces. Women's fabrics showed even more striking reductions in weight.[7]

Silk and Rayon Goods. This industry, which manufactures cloth and yarn from silk and rayon fibers, experienced much more rapid growth in output than the industries using cotton and wool. Output of silk and rayon goods in 1937 was six times as great as it had been in 1899.[8] Acceleration of production was most pronounced in the first decade, when output rose almost 80 percent; in the second and third decades the gains were close to 60 percent and even in the troubled years 1929–37 output rose by one third.[9] The major change in the composition of the industry's output is at-

[7] P. T. Cherington, *Commercial Problems of the Woolen and Worsted Industries* (Textile Foundation, 1932), p. 28.

[8] Duplication in the aggregate output of the industry did not change sufficiently to affect this index to an appreciable degree. See Appendix B.

[9] Owing to changes in the Census industrial classification no precise index for this industry can be computed for 1929–37. However, the index presented here is the best that can be constructed from the available data and is believed to be reasonably accurate.

tributable, as the following tabulation shows, to the tremendous increase in the amount of rayon used in the industry,[10] and to the far less rapid rise in the quantity of silk absorbed by it. Up to 1919 the products of the industry consisted

	Quantity Consumed (million pounds)	
	Silk	Rayon
1914	29	2
1919	37	3
1929	64	33
1935	32	140

almost entirely of silk goods. From 1919 to 1929, however, rayon goods rose in importance at a rate exceeding the growth in silk goods. And from 1929 to 1935 silk goods actually declined in output while rayon goods continued rapidly upward. In 1937, according to the detailed Census data, the output of rayon broad goods amounted to 950 million square yards; rayon-mixture broad goods to 55 million; silk broad goods to 110 million; and silk-mixture broad goods to 30 million.

Knit Goods is another textile industry which made rapid and continuous progress during the 38 years covered by our indexes. The total gain in output between 1899 and 1937 exceeded 500 percent.[11] The hosiery branch of the knit goods industry rose much more rapidly than the total: the 38-year gain was 1,200 percent. Knit underwear, on the other hand, rose only 50 percent between 1899 and 1937, and knit outer-

[10] The increase in rayon consumption during 1929–35 in the silk and rayon goods industry exceeds the increase in total rayon consumed in all textile industries. The disparity is accounted for chiefly by a decline in the quantity of rayon consumed in the cotton textile industry, as the latter is defined in the Census: from 35 million lbs. in 1929 to 19 million in 1935.

[11] The National Bureau index for the entire industry is adjusted for changes in coverage over the full period 1899–1937. The indexes for the separate branches are not so adjusted except for 1923–37. The figures (Appendix B) suggest that inaccuracies arising from this source might be expected to appear in the indexes for outerwear and underwear alone.

wear also failed to increase in output more rapidly than the group as a whole. The increase of the latter branch of knit goods production, close to 400 percent, was distributed irregularly among the four periods. Data on knit cloth are not available for the entire period: during the first decade there was a net decline of 16 percent, in the next decade production quintupled and in the third period it rose 165 percent. In 1929 output was more than ten times as great as it had been in 1899.

Within each of the branches of the knit goods industry there were changes also in the composition of output. In hosiery production, for example, the output of seamless hose in 1937 was no greater than it had been in 1919, but the output of full-fashioned hosiery was five times greater. Since the two types of hosiery are products of different machines, the change in the character of the industry's output is closely bound up with basic changes in the industry's equipment and labor force. The greater variety of designs woven into men's hose reflects changes in equipment too. In addition, there were marked shifts from one material to another in the manufacture of hosiery. Cotton declined in relative importance, while silk and rayon grew.[12] In the underwear branch of the knit goods industry also there were changes in the relative importance of different types of garments and of the several materials used. Shirts and drawers declined in output while the production of union suits rose; consumption by underwear factories of cotton and wool materials dropped but the use of silk and rayon increased.

In the knit outerwear branch there were striking increases in dress and suit production, and declines in the output of scarfs and shawls, neckties, and gloves and mittens.

[12] Because silk, cotton, and rayon stockings are each weighted by their appropriate values, rather than simply aggregated in terms of number, the shift to the more expensive silk hose causes the index of output to rise from 1919 to 1921, although the aggregate number of stockings produced actually declined.

Wool Carpets and Rugs. This classification covers establishments engaged in the manufacture from wool yarns of carpets and rugs made with jute, cotton or linen backs; it does not include the manufacture of rag carpets. The physical output of wool carpets and rugs rose from 1899 to 1937 by only 50 percent, the net effect of rises in the first and third decades, and declines in the second and fourth periods. The peak in the series was reached in 1923. The output of carpets and rugs appears to have risen in relation to the input of materials during the first two decades and to have fallen during the third and fourth periods.[13] The difference is probably associated with the great changes that occurred in the composition of the output of the carpets and rugs industry. Axminster and moquette carpets and rugs increased enormously, as did tapestry velvet and Wilton, while the output of Brussels, tapestry Brussels, and ingrain carpets and rugs fell off.

Other Floor-Coverings Industries. Asphalted-felt-base floor covering, an industry which competes to some extent with the carpets and rugs industry, made greater gains than the latter in the short period for which we have data. Between 1919 and 1929 its output more than quadrupled, and in the eight years following 1929 it rose 44 percent.[14]

Linoleum, a related industry, increased its output by 160 percent from 1904 (the first year for which we have data) to

[13] As a consequence, the net output of the industry advanced more rapidly (or fell less rapidly) than the gross output prior to 1919, and rose less rapidly (or fell more rapidly) after 1919:

	Percentage Change				
	1899–1937	1899–1909	1909–1919	1919–1929	1929–1937
Output of carpets and rugs	+52	+29	−21	+62	−8
Input of wool and yarns	+37	+18	−33	+81	−4
Net output	+79	+43	−2	+43	−10

Over the 38-year period, net output rose in relation to gross output.

[14] The index for 1919 is not precise because it could not be adjusted for change in coverage from 1919 to 1921; see Appendix B.

1937. From 1914 to 1919 output fell, but in 1923 it reached a high point exceeded only in 1929.[15] Within the industry there was a rise in the output of inlaid and linoleum rugs, and a decline in the output of plain and printed linoleum.

Cordage and Twine made but slight progress in the two more recent periods. The output of this industry rose 38 percent over the years 1899–1937, but almost all of the gain occurred between 1899 and 1914. Output in 1929 was not far above that of 1914, and from 1929 to 1937 it actually declined 8 percent. Within the industry there was a shift in the materials utilized. Cotton consumption rose, while the use of most other fibers declined. One of the most important products, binder twine, fell in output by as much as 30 percent between 1899 and 1937.[16]

Clothing. Of the five clothing industries (men's clothing, gloves, men's shirts and collars, women's clothing, and corsets) two are extremely important in terms of value added, and a third is of more than average importance. It is unfortunate, therefore, that data on quantity of output are not available for these industries for the years prior to 1927. Even the available data are probably affected seriously by quality changes. The quality of clothing is frequently modified in order that the merchandise may be adapted to rather stable retail price lines. The manufacturer and retailer can "adjust for raw material price fluctuations by shifting from one standard [cloth] construction to another without changing the retail price of the finished article. A rise in the price of 80 x 80 gray cloth, for example, from 7½ to 10 cents per yard would throw printed percales made from this construction out of the range the dollar dress cutter could pay. After the supply of goods he had purchased in expectation of that

[15] The 1904–19 indexes are unadjusted and susceptible to some error on that account; see Appendix B.

[16] Our figures do not include the considerable output of binder twine made in penal institutions.

price rise had been exhausted, he would be obliged to turn to the next cheaper construction of percales for his dollar dress line; i.e., 68 x 72s and so on. Over the last 15 years all these constructions have been used for the dollar dress at one time or another." [17]

The output of men's clothing, including youths' and boys' suits, coats, trousers and overalls, changed only slightly between 1927 and 1929 and again between 1929 and 1937. In the entire decade there was a net rise of only 2 percent. In considerable contrast to these minor changes are the important increases in the output of the women's clothing industry. Women's clothing, which includes children's and infants' wear, as well as women's coats, suits, dresses, skirts, underwear and nightwear, rose almost 50 percent from 1927 to 1937.[18] There were especially large increases from 1929 to 1937 in the output of women's suits, ensembles, separate skirts, blouses and shirtwaists, washable service apparel, kimonos and bathrobes, aprons and hoovers. Textile gloves (made of cloth or cloth and leather combined) declined 7 percent from 1927 to 1937. Men's shirts and collars fell 8

[17] *Textile Markets,* pp. 90–91.

[18] These percentage changes are exceedingly rough measures of output since they reflect merely changes in the number of garments of each general type. For example, one of our series is "dresses, 1-piece," of which 163 million were produced in 1929. The figure is the sum of the following quantities, each relating to a particular retail price line:

Retail Price Line	*Quantity (Millions)*
Under $1.00	23
$1 to $1.99	36
$2 to $2.99	16
$3 to $4.99	14
$5 to $9.99	35
$10 to $24.99	31
$25 and over	8
	163

These price differences reflect variations not only in the amount and quality of materials and trimmings, but also in the labor utilized in the process of fabrication.

percent in the same period. Collar output decreased steadily, from 8 million dozen in 1927 to 1.2 million in 1935 (the last year covered by the data on this product). The corsets industry increased its output by 29 percent from 1929 to 1937. There were increases in the production of brassieres, and of corsets, girdles and garter belts, and decreases in combinations or one-piece garments.

The two clothing accessory industries listed in Table 23, handkerchiefs and elastic woven goods, decreased their output from 1929 to 1937. Output in the former industry fell by 14 percent. Elastic woven goods, including suspenders and garters, declined by 37 percent.

Hats. The four hat industries distinguished by the Census differed greatly with respect to rate of increase in output. Fur-felt hats, made from hatters' fur, rose by one fourth between 1899 and 1937, and wool-felt hats almost doubled in the same period. Neither of these net percentages can be considered an accurate reflection of the trend, however. The output of fur-felt hats reached a peak in 1909. In wool-felt hat production a low point occurred in 1921, and 1909, 1919 and 1929 were all below the initial (1899) and final (1937) levels. For the period 1929–37 indexes are available for all four industries: wool-felt hats rose 156 percent, and men's straw hats 58 percent; fur-felt hats remained constant, and cloth hats (silk hats, caps, industrial hats, etc.) fell 47 percent. Within the fur-felt hats industry the output of finished hats fell slightly from 1899 to 1937, while hat bodies and hats in the rough rose many-fold.[19] A similar change in composition characterized the output of wool-felt hats. In 1899, 56,000 dozen hat bodies and 811,000 dozen finished hats were produced, but in 1937 the corresponding quantities were 2,428,000 dozen hat bodies and 372,000 dozen finished hats.

[19] An increasing degree of duplication in the output of the fur-felt hats industry causes our index to overstate the rise in the industry's output; see Appendix B.

Summary of Changes in Individual Industries. The trends in physical output are summarized in Table 24. Over the period 1899–1937 as a whole only one of the textile industries for which we have data, linen goods, declined in physical output. In the first decade, 1899–1909, there were two

TABLE 24
TEXTILE PRODUCTS
Summary of Changes in Physical Output[a]

	Number of Industries				
	1899–1937	1899–1909	1909–1919	1919–1929	1929–1937
Industries for which there are indexes of physical output	13	14	17	19	27
Industries with output rising	12	12	11	16	14
Industries with output constant	..	..	..	..	1
Industries with output falling	1	2	6	3	12
Industries with output rising in relation to population	7	12	5	10	13
Industries with output falling in relation to population	6	2	12	9[b]	14
Industries with output rising in relation to total manufacturing output	3	5	4	5	13
Industries with output falling in relation to total manufacturing output	10	9	13	14	14

[a] Derived from data in Table 23, and from figures on changes in population and in total manufacturing output given in footnote a, Table 14.
[b] Includes one industry with output constant in relation to population.

declining textile industries, knit cloth and wool-felt hats. The number with declining output rose to six in 1909–1919: worsted goods, wool carpets and rugs, linen goods, fur-felt and wool-felt hats, and oilcloth. Between 1919 and 1929, however, only three textile industries declined in output: worsted goods, knit underwear, and jute goods. In the last period, 1929–37, almost half the industries decreased their output.

Measured in relation to population growth during the 38 years, almost half the industries for which indexes are available declined in output. Besides linen goods, which fell absolutely, there were relative declines in the output of woolen and worsted goods, knit underwear, wool carpets and rugs, cordage and twine, and fur-felt hats. In the first decade the rate of output of 2 out of 14 industries fell below the rate of population growth; in the second, 12 out of 17 suffered a similar decline; in the third, 8 out of 19; and in the last period, 14 out of 27.

In relation to the growth in the output of all manufacturing industries combined, more textile industries declined than rose. This was true of the period as a whole and of each of the periods into which we have divided it.

The Group Total. The index of physical output of the entire textile products group, based on available samples, rose 153 percent between 1899 and 1937. But according to the data on value added the importance of the sample declined somewhat in that period. After correction for this downward bias the index shows an increase of 180 percent. Both adjusted and unadjusted indexes rose most rapidly in the first decade, more slowly in the third decade, and much more slowly in the second and fourth periods. The decline in the adjusted index from 1914 to 1919 is especially striking.

CHANGES IN THE INDUSTRIAL PATTERN OF TEXTILE PRODUCTION

There was a radical transformation of the industrial pattern of textile production in the period 1899–1937. That pattern is depicted, insofar as the data permit, in Table 25, which gives the percentage contributions of each industry to the physical output of the entire group for selected years. In 1899 the cotton goods industry contributed 22.4 percent to the physical output of the entire group, but by 1937 the

TABLE 25

TEXTILE PRODUCTS

Relative Contributions of Component Industries to the Physical Output of the Entire Group[a]

Group	*Percentage Distribution, Comparable Pairs of Years*									
	1899	1937	1899	1909	1909	1919	1919	1929	1929	1937
Cotton goods	22.4	16.6	22.5	19.3	21.1	22.0	21.0	17.9	17.0	15.8
Silk and rayon goods	3.3	7.4	5.4	6.0	5.1	7.4	6.9	7.2	5.8	7.3
Woolen and worsted goods	14.3	8.4	12.7	11.4	12.2	10.4	11.3	7.7	8.5	9.1
Knit goods	5.1	11.4	6.2	6.7	5.5	8.2	8.1	9.8	9.9	10.5
Carpets and rugs, wool	3.8	2.1	3.0	2.4	2.2	1.6	1.8	1.9	2.6	2.2
Cordage and twine	1.7	0.8	1.4	1.1	1.1	1.1	1.2	0.9	1.0	0.8
Jute goods	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4
Linen goods	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Hats, fur-felt	2.1	1.0	2.0	2.0	1.8	1.2	1.4	1.0	1.2	1.1
Hats, wool-felt	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Wool shoddy			0.3	0.2	0.2	0.2	0.2	0.1	[e]	[e]
Oilcloth					0.2	0.1	0.1	0.2	0.2	0.1
Lace goods							0.5	0.4	0.4	0.6
Linoleum							0.7	1.0	0.8	0.6
Asphalted-felt-base floor covering									0.4	0.6
Gloves, textile, n.e.m.[b]									0.4	0.3
Clothing, men's									11.6	10.8
Clothing, women's, n.e.c.[c]	46.2	51.7							14.8	17.3
Corsets			45.8	50.1	49.9	47.2			1.0	1.3
Shirts and collars, men's									2.6	2.4
Handkerchiefs							46.1	51.4	0.3	0.3
Elastic woven goods n.e.m.[b]									0.3	0.2
Hats, cloth									0.4	0.2
Hats, straw, men's									0.2	0.3
Artificial leather									0.3	0.3
All other products									19.8[e]	17.2[e]
TOTAL[d]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] Derived from Table 23. For an explanation of the derivation of the measurements see footnote 10, Chapter 4.

[b] N.e.m. denotes not elsewhere made.

[c] N.e.c. denotes not elsewhere classified.

[d] The columns do not add up to 100.0 in every instance because they contain rounded percentages.

[e] Wool shoddy is included in all other textile industries.

percentage had fallen to 16.6. There were declines in the relative contribution of this industry in three of the four subperiods as well. The relative contribution of woolen and worsted goods fell also, from 14.3 percent in 1899 to 8.4 in 1937, and only in the last period, 1929–37, was there a rise in that industry's share of total output. Declines between 1899 and 1937 are to be noted also for wool carpets and rugs, cordage and twine, and fur-felt hats. On the other hand there were important and consistent advances in the relative contributions of silk and rayon goods. Industries for which no separate data are available increased their aggregate relative contribution from 46.2 to 51.7 percent.

The data on value added (Table 26) serve to fill in a number of gaps in the record of physical output. The most interesting supplementary information relates to the clothing industries. Men's clothing decreased in relative importance between 1899 and 1937: its contribution fell from 14.9 to 11.6 percent of the total value added by the group. Men's collars and shirts fell also, from 4.4 to 2.6 percent. On the other hand, women's clothing rose sharply, from 9.8 to 15.9 percent. Less important changes also are to be noted: declines in cloth and straw hats; rises in dyeing and finishing, in embroideries, trimmings, millinery, and house furnishings. Surprisingly enough, the relative contribution of silk and rayon goods in terms of value added rose from 1899 to 1929, then fell to a point lower than that of 1899.[20] In most

[20] The 1929–37 movement of the industry's share of value added contrasts sharply with the trend of the industry's contribution to physical output for the same years. This variation brings into question the accuracy of the index of physical output of silk and rayon goods for 1929–37 (and particularly for 1933–35), as well as the accuracy of the data on value added for the same period. In this connection, see footnotes 1 and 9, above. If errors exist, they probably arise from changes in the definition of the industry, and are counterbalanced—so far as the group index is concerned—by changes in the opposite direction in other textile industries. While the exact magnitude of the rise in the physical output of silk and rayon goods between 1929 and 1937 may be in doubt, there can hardly be any question that a substantial rise did occur, since non-Census data tend to support such a view.

TABLE 26

TEXTILE PRODUCTS

Relative Contributions of Component Industries to the Value Added by the Entire Group[a]

Industry	*Percentage Distribution*[b]					
	1899	1909 Comparable with 1899	1909 Comparable with 1919	1919	1929	1937
Cotton goods	22.3	19.7	19.5	22.8	15.6	17.8
Cotton small wares	0.5	0.5	0.5	0.5	0.8	0.7
Lace goods	..	..	[c]	0.4	0.5	0.6
Woolen goods	6.7	3.2	3.2	4.0	3.2	4.1
Worsted goods	6.1	8.2	8.1	6.8	5.0	5.4
Haircloth	[d]	*	0.1	*	*	
Wool pulling	0.1	0.1	0.1	0.1	0.1	0.1
Wool scouring	0.1	0.1	0.1	0.2	0.1	0.1
Silk and rayon goods	5.4	6.0	6.0	6.9	7.1	5.1
Dyeing and finishing	3.8	3.8	3.8	4.0	5.8	5.1
Hosiery, knit	6.1	6.9	6.8	7.5	6.8	6.6
Underwear, knit					1.8	1.8
Outerwear, knit					1.7	1.7
Cloth, knit					0.5	0.8
Carpets and rugs, rag	0.2	0.1	0.2	0.1	0.1	*
Carpets and rugs, wool	3.0	2.5	2.4	1.5	2.3	2.6
Mats and matting	0.1	0.1	0.1	0.1	0.1	0.1
Asphalted-felt-base floor covering	0.4	0.4	0.4	0.6	0.4	0.5
Linoleum					0.8	0.7
Cordage and twine	1.6	1.0	1.0	1.2	0.9	0.9
Jute goods	0.3	0.4	0.4	0.4	0.2	0.4
Linen goods	0.2	0.2	0.2	0.1	0.1	0.1
Clothing, men's, work	14.7	15.1	14.9	12.1	1.3	2.3
Clothing, men's, n.e.c.[e]					9.6	
Clothing, men's buttonholes	0.1	0.1	0.1	*	*	9.3
Cloth sponging and refinishing	0.1	0.1	0.1	0.1	0.1	
Furnishings, men's, n.e.c.[e]	1.5	1.2	1.2	1.2	1.7	1.1
Gloves, textile, n.e.m.[f]				0.3	0.3	0.4
Shirts	3.0	2.5	2.5	1.8	2.4	2.6
Collars, men's	1.4	0.9	0.9	0.8	0.1	
Clothing, women's, n.e.c.[e]	9.8	13.0	12.9	12.8	15.7	15.9
Corsets	1.1	1.4	1.4	1.0	1.0	1.3
Embroideries	1.9	3.2	3.2	3.3	0.5	0.4
Millinery					2.5	1.6
Trimmings, n.e.m.[f]					0.6	0.6
Handkerchiefs				[g]	0.3	0.2
Elastic woven goods, n.e.m.[f]		[g]	0.9	0.7	0.3	0.2

For footnotes see end of table, p. 188.

TABLE 26 (concluded)

Industry	*Percentage Distribution*[b]					
	1899	1909 Comparable with 1899	1909 Comparable with 1919	1919	1929	1937
Hats, fur-felt	2.0	2.0	2.0	1.2	1.2	1.1
Hats, cloth	1.5	0.5	0.5	0.6	0.5	0.2
Hats, straw, men's		0.8	0.8	0.4	0.2	0.2
Hats, wool-felt	0.2	0.1	0.2	0.1	0.1	0.2
Hat and cap materials	0.2	0.2	0.2	0.3	0.2	0.2
Fur goods	1.6	1.9	1.9	1.8	2.6	1.6
Furs, dressed	0.1	0.1	0.1	0.4	0.6	0.5
Artificial leather	0.2	0.2	0.1	0.2	0.3	0.3
Awnings	0.6	0.5	0.5	0.5	0.6	0.4
Bags, textile, n.e.m.[f]	0.4	0.7	0.7	1.0	0.6	0.9
Belting, woven, n.e.m.[f]	*	0.1	0.2	0.2	*	
Housefurnishings, n.e.c.[e]	0.7	0.5	0.5	0.6	1.3	1.7
Horse blankets	0.1	0.1	0.1	0.1	*	
Felt goods	0.4	0.4	0.4	0.4	0.5	0.4
Flags and banners	0.1	0.1	0.1	0.1	0.1	0.1
Regalia	0.2	0.3	0.3	0.1	0.1	
Oilcloth	0.1	0.2	0.2	0.1	0.2	0.1
Nets and seines	0.1	*	*	*	0.1	*
Upholstering materials, n.e.c.[e]	0.4[d]	0.2	0.2	0.1	0.1	0.4
Wool shoddy	0.3	0.2	0.2	0.2	0.1	0.4
Waste	0.1	0.2	0.2	0.2	0.3	
TOTAL[h]	100.0	100.0	100.0	100.0	100.0	100.0

* Less than half of one percent.

[a] Basic data are given in Appendix C.

[b] Incomparabilities arising from changes in definitions of industries are noted in footnote 1 of this chapter, and cited in detail in Appendix A.

[c] Included in cotton goods and cotton small wares.

[d] Haircloth is included in upholstering materials, n.e.c.

[e] N.e.c. denotes not elsewhere classified.

[f] N.e.m. denotes not elsewhere made.

[g] Included in various other (chiefly textile) industries.

[h] The columns do not add up to 100.0 in every instance because they contain rounded percentages.

other respects the figures in Table 26 are consistent with those in Table 25.

The change in the industrial composition of textile manufactures may be gauged also in terms of the fibers utilized

(Table 27). Judged by the rather crude measure of weight, the changes in the character of the fibers consumed in textile manufacture appear to have been slight. Hemp, jute and similar fibers declined in importance, whereas rayon rose

TABLE 27

TEXTILE PRODUCTS

Raw Fibers Consumed in Textile Mills[a]

Type of Fiber	*1899*	*1909*	*1919*	*1929*	*1937*
		QUANTITY (million pounds)			
Cotton	1,923.7	2,465.2	2,905.8	3,635.3	3,784.0
Wool[b]	251.9	358.3	299.7	389.8	391.8
Animal hair[c]	34.8	41.6	55.4	84.1	85.4
Silk	9.8	17.7	27.9	64.2	54.4
Flax	17.0	28.1	12.8	14.5	10.7
Hemp, jute, etc.	507.8	632.8	570.5	528.1	478.8
Rayon yarn		0.9	8.0	128.3	254.9
Rayon staple fiber and waste					43.6
Other, not given in detail					3.9
TOTAL	2,745.0	3,544.6	3,880.1	4,844.3	5,107.5
		PERCENTAGE DISTRIBUTION			
Cotton	70.1	69.5	74.9	75.0	74.1
Wool[b]	9.2	10.1	7.7	8.1	7.7
Animal hair[c]	1.3	1.2	1.4	1.7	1.7
Silk	0.3	0.5	0.7	1.3	1.0
Flax	0.6	0.8	0.4	0.3	0.2
Hemp, jute, etc.	18.5	17.9	14.7	10.9	9.4
Rayon yarn		0.0	0.2	2.7	5.0
Rayon staple fiber and waste					0.8
Other, not given in detail					0.1
TOTAL	100.0	100.0	100.0	100.0	100.0

[a] Derived from data given in the U.S. Census of Manufactures.
[b] Scoured weight.
[c] Includes some hatters' fur.

rapidly. The decline in wool and flax, and the rise in animal hair and silk, were all of minor significance, although the use made of these fibers changed considerably. The consumption of silk rose many-fold between 1899 and 1937, but in terms

of its effects on fiber consumption by the group as a whole, the changes were small.[21]

The character of textile manufacture changed in still another respect—basic technical processes. Factory knitting is more important today than it was in 1900, an advance achieved partly at the expense of weaving. Thanks to the shift of clothing production from the home and retail tailorshop to the factory, more textile manufacturing is devoted today to the cutting of cloth and the sewing of garments than was the case at the opening of the century. "Men's clothing, an industry that at first catered almost exclusively to slaves and sailors, and to the least exacting class of common laborers, now competes with the best custom tailors." [22] The movement from home and custom dressmaking to factory dress production has probably been of even greater magnitude than the corresponding transfer of men's clothing production.

[21] The data on consumption of fibers do not agree in every respect with corresponding data on production because consumer reports to the Census of Manufactures have been incomplete. See, on this point, *Rayon Organon* (Dec. 1937), p. 177. Any minor errors present in Table 27 would scarcely affect the conclusions we have drawn from it.

[22] V. S. Clark, *History of Manufactures in the United States* (McGraw Hill, 1929), Vol. III, p. 224.