

TABLE 107.—*Rates of wages paid in the domestic and English bobbinet industries for auxiliary processes*

Process	Domestic rates	English rates ¹
Slip-winding 20/2.....	\$0.145 per bundle (10 pounds).	4¼d. = \$0.0862 per bundle (10 pounds).
30/2.....	\$0.160 per bundle.....	5½d. = .1115 per bundle.
40/2.....	\$0.177 per bundle.....	6¼d. = .1267 per bundle.
50/2.....	\$0.207 per bundle.....	7½d. = .1521 per bundle.
80/2.....	\$0.355 per bundle.....	10½d. = .2129 per bundle.
	The average weekly wages for this process paid by the firms from whom these figures were obtained is \$21.	Less 25 percent.
		17¼
Warping.....	(\$0.85 to \$0.90 per hour.....)	15d. per hour = \$0.3042.
	Average per week, \$40.....	Week of 48 hours, £3 = \$14.60, less 25 percent.
Brass-bobbin winding.....	\$0.26 per 1,000.....	All gages, up to and including 125 yards, per 1,000, 6¼d. = \$0.1369.
	\$0.45, \$0.50, \$0.60 per hour.....	¼d. extra for every 25 yards or portion thereof, less 33¼ percent.
	Average per week, \$27.25.....	Small bobbins per 1,000:
		Up to 16 years of age, 7¼d. = \$0.1470.
		Over 16 years of age, 8¼d. = \$0.1673.
Threading.....	(\$0.276 per 1,000, 7-point.....)	Large bobbins per 1,000:
	\$0.304 per 1,000, 9-point.....	Up to 16 years of age, 8¼d. = \$0.1673.
	Average per week, \$21.50.....	Over 16 years of age, 9¼d. = \$0.1876.
		Less 33¼ percent.

¹ At the commencement of 1933 the following alterations were in force: Threaders, brass winders, slip-winders, menders: Decrease of 8¼ percent in list prices, making a total reduction of 33¼ percent for threaders and brass winders, and 25 percent for slip winders and menders (35% and 27¼ percent, respectively, in west England). Other auxiliary workers: Decrease of 5 percent on list price, making a total reduction of 20 percent (22¼ percent in west England). Twist hands: Revised payments adopted for artificial silk nets, viz: Artificial silk yarn reduced to equivalent size in cotton, and extras for counts and silk as price card.

3. Wage rates in the silk bobbinet industry in Lyons

The manufacture of silk bobbinets in France is centered in Lyons and vicinity. The card under which tullistes are paid in this region was established on October 1, 1919. Fluctuations in the value of the franc and in the cost of living, however, have made necessary frequent increases, and in recent years some decreases, in the rack rates. These changes have been made by applying to the basic rates coefficients equal to the index figures representing the increases or decreases in the cost of living, as established by the Regional Commission of the Prefecture of the Rhone. The following table 108 shows the cost of living indexes from August 1920 to March 1928 based upon the cost of living on July 1, 1914, taken as 100. The basic card for the payment of twist hands in the Lyons bobbinet mills was established October 1, 1919; the increase in the cost of living and thus of wages between the latter date and August 1920 (the date of the first coefficient shown), as established by the Syndicate of Silk Manufacturers of Lyons, was 20 percent—thereafter the increases have followed the indexes in the table.

The basic wage rates increased by coefficients do not represent absolutely the wages paid to the tullistes. The basic rates merely have offered a basis for bargaining between the employees and their employers. In general, tullistes' wages have increased more than the cost of living index during busy seasons, and less during dull seasons.

TABLE 108.—*Index of the cost of living fixed by the Regional Commission of the Prefecture of the Rhone*

Date	Index figure	Date	Index figure
August 1920.....	316	December 1926.....	500
December 1924.....	338	December 1927.....	461
December 1925.....	379	March 1928.....	459

IX. COST DATA

1. Material costs

In the manufacture of bobbinets yarns are used for two purposes, for warp and for brass bobbins; the ascertainment of the amount of each in a winding does not present any difficulty. The weight of yarn in a full set of bobbins is ascertained by multiplying the number of bobbins in the set by the number of yards wound on the set, and dividing by the number of yards per pound of the specific yarn count used. When the set is taken from the machine and stripped, the weight of the waste is deducted from the weight of yarn in the full set and the remainder is the amount of bobbin yarn in the piece. The remainder of the weight of the piece is warp yarn. Material costs also include dyes and chemicals.

2. Comparability of domestic and foreign bobbinets of cotton and silk

The number of variable factors to be considered in the comparison of domestic and foreign bobbinets is reduced to three, viz.: yarn counts, weight per unit, and countable quality. Other points of construction may be disregarded for the following reasons: There is no pattern; the gage of the machine and the quality of net on the machine cannot be determined after the piece is finished, because the web is so elastic that in dressing it is stretched to a wider width and draws up to a shorter length than the dimensions on the machine; the finished area is greater than the brown area. Nets made in different qualities on machines of different gages can be dressed to have the same hole count and appearance and are competitive.

3. Comparison of domestic and English costs of cotton bobbinet

The latest data available with respect to domestic and foreign costs of production are those obtained by the Tariff Commission in a cost investigation completed in 1924. These data, a decade old, are here recorded as indicative of conditions at that time.

Table 109 shows costs of production of 6 domestic cotton bobbinets and of 6 comparable British bobbinets. The British costs are shown only as totals; the domestic costs are subdivided to show material, labor, and expense.

TABLE 109.—*Plain nets of cotton made on the bobbinet machine: Costs of production in the United States and in England, 1924*

[Per square yard]

No.	Material	Manufacturing labor	Manufacturing expense	Total mill cost	No.	Material	Manufacturing labor	Manufacturing expense	Total mill cost
<i>Domestic</i>					<i>British</i>				
1	\$0.0758	\$0.0740	\$0.1753	\$0.3251	1				\$0.1049
2	.0869	.0505	.0420	.1794	2				.0767
3	.0611	.0496	.1171	.2278	3				.0874
4	.1482	.1343	.0799	.3624	4				.1456
5	.1462	.0749	.0451	.2662	5				.1230
6	.1224	.1170	.2776	.5170	6				.1027
Average	.1068	.0834	.1228	.3130	Average				.1067

The percentages which material, labor, and expense, constituted of total domestic mill cost were 34, 27, and 39, respectively. The manufacturing expense of the domestic mills averaged 148 percent of the manufacturing labor cost.

Table 110 compares by percentages the average costs of 6 domestic cotton nets with the average costs of 6 like or similar British nets.

TABLE 110.—*Cotton bobbinets: Ratio of domestic costs to British costs, 1924*

[Per square yard]

	Domestic	British	Excess of domestic over British cost
Total cost at plant	\$0.3130	\$0.1067	Percent 193.91
Transportation and other charges to New York	.0011	.0116	
Total cost delivered at New York	.3141	.1183	165.

4. Costs of cotton bobbinets from countries other than Great Britain

Table 111 shows costs of production of domestic cotton bobbinets and of comparable cotton bobbinets manufactured in Germany, France, and Switzerland. These costs are broken down into material costs, direct labor costs, and manufacturing costs. The variation in the costs shown for domestic bobbinets is due to the fact that the number of samples and the specific samples themselves were different in each comparison, and the percentages of domestic costs were based upon the specific costs with which the costs from each country were compared.

TABLE 111.—*Cotton bobbinets: Comparison of details of domestic costs with details of foreign costs, other than British, 1924*

[Per square yard]

Country	Number of samples	Costs				Percent of total mill cost		
		Material	Labor	Manufacturing expense	Total mill cost	Material	Labor	Manufacturing expense
United States	11	\$0.0950	\$0.0765	\$0.1164	\$0.2879	33.00	26.57	40.43
Germany	11	.0620	.0305	.0114	.1039	59.67	29.36	10.97
United States	4	.1124	.0789	.0765	.2678	41.97	29.46	28.57
France	4	.0815	.0170	.0171	.1156	70.50	14.70	14.80
United States	10					35.41	26.89	37.70
Switzerland ¹	10					61.75	² 32.52	³ 5.73

¹ There is only one bobbinet mill in Switzerland; to avoid revealing confidential information the basic data are therefore omitted.

² Yarn preparation, making, and mending labor only.

³ Includes finishing labor.

As shown by table 111, which breaks down domestic and foreign costs into material costs, direct labor costs, and manufacturing expense, domestic costs in all three classifications are higher than similar foreign costs. However, with a single exception, the greatest disparities between domestic and foreign costs, both absolutely and in relation to total costs, occur in the item "manufacturing expense." This cost, which includes overhead and all fixed charges, declines per unit directly as efficiency of production per unit increases. The single exception is the item of French "labor costs" in the production of cotton bobbinets; these costs are quite low, both in relation to American labor cost and in relation to their own total cost, yet the fact remains that the British industry, paying higher wages than the French, is the principal producer and exporter of bobbinets.

Bobbinet is the sole item of production in only one domestic mill; its production is a minor item in lace plants specializing in other types of lace. Domestic bobbinet production, therefore, depends largely upon other branches of the lace industry for its financial support.

5. Costs of silk bobbinets

In 1929, the last year for which data concerning imports of silk bobbinets by countries are available, Great Britain supplied 53.01 percent and France 45.76 percent of all silk nets imported into the United States. France was the most important source of silk nets prior to the year 1928. The United States Tariff Commission in

1924 obtained costs on samples of British silk nets, but it was impracticable to obtain similar information concerning French silk nets. Table 112 shows costs of comparable domestic and British silk nets, the costs being broken down into material costs, direct labor costs, and manufacturing costs.

TABLE 112.—*Silk bobbins: Comparison of details of domestic costs with details of foreign costs, 1924*

[Per square yard]

Country	Number of samples	Costs				Percent of total mill costs		
		Material	Labor	Manufacturing expense	Total mill cost	Material	Labor	Manufacturing expense
United States.....	4	\$0.1845	\$0.1579	\$0.2959	\$0.6383	28.90	24.74	46.36
Great Britain.....	4	.1499	.0572	.0440	.2511	59.70	22.78	17.52

Table 113 compares domestic cost and domestic and British mill selling prices of silk bobbinet and the dutiable value of French silk nets.

TABLE 113.—*Silk bobbins: Costs and selling prices of domestic bobbins and mill selling price, and dutiable value of English and French silk bobbins, 1924*

[Per square yard]

Country	Domestic cost at plant	Mill selling price	Dutiable value	Excess of domestic cost over foreign mill selling price	Excess of domestic cost over foreign selling price
United States.....	\$0.6383	\$0.7177			
England.....		.2300			
France.....			\$0.2273		
				Percent	Percent
				177	212
				181	216

X. PRICES

1. Prices of domestic bobbins

Table 114 shows the range of wholesale prices of cotton bobbins from 1913 to 1933. These wholesale prices are supplied by representative domestic manufacturers. Cotton and silk nets are sold by domestic manufacturers both to jobbers and to the retail trade.

TABLE 114.—*Domestic bobbins, of cotton: Wholesale prices per square yard, in New York, 1913-33.¹*

Year	Made by domestic manufacturer A			Made by domestic manufacturer B ²	
	Net for curtains	Mosquito net	Wash blonde	Net for curtains	Mosquito net
1913.....	\$0.11½	\$0.14		\$0.11½	\$0.21
1914.....	.11½	.14		.11½	.21
1915.....	.12½	.15½		.11½	.21
1916.....	.12½	.16½		.18	.23
1917.....	.20¼	.33½		.22½	.40½
1918.....	.20¼	.33½		.26¼	.48
1919.....	.20¼	.33½		.33½	.53½
1920.....	.25½	.34½		.39¼	\$0.66½-.39
1921.....	.18¼	.24¼		.24	.37
1922.....	.16½	.23½		.16½	.35
1923.....	.18¼	.24¼		.18	.32
1924.....	.18¼	.24¼	\$0.20½	.17½	.31
1925.....	.18¼	.24¼	.20¼	.18½	.34
1926.....	.18¼	.24¼	.23¼	.17	.32¾
1927.....	.18¼	.24¼	.23¼	.16	.30½
1928.....	.21¾	.29¼	.32	.15½	.30½
1929.....	.21¾	.29¼	.32	.14½	.30
1930.....	.20¾	.27	.30½	.13½	.27
1931.....	.20¾	.27	.30½	.13½	.26
1932.....	.19¾	.25½	.29	.12½	.25
1933.....	.24½	.31¾	.35½	.13½	.27½

¹ Ferguson's "Histoire de Tulle" gives the following table of prices per square yard of "Bobbinet", in the year of the invention of the machine, and over a period of 47 years; there is, however, no indication that the variable factors inherent in net were the same during the whole period.

Year	French price	United States equivalent	Year	French price	United States equivalent
1809.....	Francs 125	\$24.125	1830.....	Francs 2.50	\$0.4825
1813.....	50	9.65	1833.....	1.65	.3185
1815.....	37.50	7.2375	1836.....	1.00	.193
1818.....	25	4.825	1842.....	.60	.1158
1821.....	15	2.895	1850.....	.40	.0772
1824.....	10	1.93	1856.....	.30	.0579
1827.....	5	.965			

Conversion to United States currency is made at the par rate of \$0.193.

² These prices are to the retail trade. Manufacturers and others who buy in large quantities, or in pieces the full width of the machine, obtain a discount of 10 percent.

2. Prices of foreign cotton bobbins

Certain importers specialize in the importation of nets and nettings; however, general importers of lace handle nets and nettings as well. Table 115 shows the invoice prices (in English pence) quoted on a 39-hole British cotton net from 1913 to 1927 and a 38-hole net from 1928 to 1933. These two counts were imported in larger quantities than any other count during this period.

TABLE 115.—*Invoice prices of cotton net, 39-hole, 70/72 inches width from Great Britain, 1913-33*

Year	Price	Year	Price
1913.....	11¼d. net, net.	1924.....	12d. net, net.
1914.....	8d. net, net.	1925.....	12½d. net, net.
1915.....	9¼d. net, net.	1926.....	11½d. net, net.
1916.....	12¼d. net, net.	1927.....	12¼d. net, net.
1917.....	14d. net, net.	1928 ¹	15d., 20 percent discount.
1918.....	17d. net, net.	1929 ¹	14¾/14d., 20 percent discount.
1919.....	23d. net, net.	1930 ¹	14¾/15d., 20 percent discount.
1920.....	30¾d. net, net.	1931 ¹	14/12¾d., 20 percent discount.
1921.....	15¾d. net, net.	1932 ¹	12¾/11¼d., 20 percent discount.
1922.....	13¾d. net, net.	1933 ¹	11¾d., 20 percent discount.
1923.....	11¼d. net, net.		

¹ 38-hole.

Table 116 shows the invoice prices and wholesale selling prices of cotton bobbinets used for mosquito netting from 1914 to 1932. The net was of 20/21 hole quality, 40/2 warp, 60/2 bobbin, 108 inches wide. The quality of nets listed as mosquito nets by the appraisers' office at New York ranges from 15 to 31 holes, and on a similar basis, the standard required by the Government for Army purposes, 182 holes per square inch, is equivalent to 27 holes.

TABLE 116.—Cotton bobbinets used for mosquito netting, 20/21 quality: Foreign values, in English pence, and American selling prices, in cents

[Per linear yard, 108 inches wide]

Date	Invoice prices (less 15 percent, 2½ percent, and 2½ percent)	Date	Wholesale selling price in the United States (net 10 days)
	Pence		Cents
November 18, 1914	7½	March 1915	22
November 15, 1915	7¼	February 1916	35
June 8, 1916	7½		
May 28, 1918	22	June 1918	80
November 9, 1918	22		
November 7, 1919	24	June 1919	90
July 16, 1920	26	May 1920	90
July 1, 1921	20½	June 1921	62½
December 4, 1922	17	December 1922	50
January 1923	17		
December 1923	15		
January 1924	16½	1924	52½
March 1925	16	1925	57½
January:		1926	55
1926	15½	1927	50
1927	13	1928	52½
December:		1928	47½-55
1927	14	1929	47½-55
1928	12½	1930	47½-55
1929	12½	1931	42½-47½
1930	11½	1932	35-42½
1931	10½		
1932	10½		

The Bureau of Labor Statistics' Wholesale Price Index for Cotton Textile Products was in 1915, 52.3; in 1920, 190.7; and in 1930, 87.4. The increases in 1920 and 1930 over 1915 are thus 264.6 and 67.1 percent, respectively. For the purposes of comparing cotton net prices with this commodity index, we may choose quality 20/21 net used for mosquito net; the price for this net was in 1915, 22 cents per linear yard; in 1920, 90 cents; and in 1930, 51½, the increases over 1915 being 309.1 percent in 1920 and 133 percent in 1930. Evidently, then, the increase in the selling price of 20/21 quality net in 1920 exceeded the rise in prices of cotton textiles in general, but by 1930 the selling price had declined more than prices of cotton textiles in general.

3. Dutiable value

The difficulties of ascertaining uniform foreign selling prices of bobbinet for the assessment of domestic tariff duties have necessitated the establishment of uniform dutiable values. Schedules of dutiable values are published periodically by the United States appraisers' office in New York. Uniform dutiable values for British nets were first established for a short period about the year 1909, but the system was dropped after complaints by the Nottingham manufacturers. After the war the system was reestablished for British nets and later extended to all foreign nets. The British trade still complains however, that the average values established constitute a disadvantage to manufacturers who have attained the greatest economy in production.

Table 117 reproduces the schedule of dutiable values per linear yard which were effective at New York in September 1933; table 118 shows the trend of dutiable values from December 1913 to October 1931.

TABLE 117.—British cotton bobbinets: Customs schedule of dutiable values, in English pence per linear yard less 20 and 1¼ percent, effective at New York, September 1933

NOTTINGHAM NET SCHEDULE, WASH BLONDE NETS¹

Holes	White, 72 inches	Water-dressed or natural, 216 inches	Holes	White, 72 inches	Water-dressed or natural, 216 inches
18	5½	15	36	11½	33½
19	5½	15½	37	12½	34½
20	6	15½	38	12½	35½
21	6½	16½	39	13½	37½
22	6½	16½	40	14	39½
23	6½	17½	41	14½	41½
24	7	18½	42	15½	43½
25	7½	21½	43	16½	46½
26	8½	22½	44	16½	47½
27	8½	23½	45	17½	51½
28	9	24	46	18½	54½
29	9½	26½	47	20	58½
30	9½	27	48	21½	61½
31	10	27½	49	22½	64
32	10½	28½	50	23½	66
33	10½	29½	51	24	68
34	10½	30½	52	24½	70
35	11½	32			

¹ Exceptions to schedule: Wash blonde 72 inches white, prices are for goods unboxed, ¼d. more if boxed; cream and ivory, ¼d. extra; ecru, ochre, beige, and paris ¼d. extra; black and colors 1d. extra; wash blonde 216 inches wide, prices are for waterdressed or natural, if scoured, 1½d. extra; white, 2d. extra; cream and ivory 2½d. extra; ecru, ochre, beige, and paris 3½d. extra; black and colors 5d. extra. All less 20 and 1¼ percent. Schedule applies to ordinary qualities made with 2-ply yarn in warp, single yarn in filling and ordinary finish.

NOTE.—Merchandise must be invoiced at prices actually paid for same and additions or reductions to make market value may be made at time of entry.

TABLE 118.—*British cotton bobbins: Dutiable value, net, in English pence per linear yard, 1913-34*

Date	Bretonne nets, 72 inches wide		Double grade cable or mosquito net, 240 inches wide, 20 holes
	35 holes	40 holes	
Dec. 12, 1913.....	97%	12	20½
Jan. 31, 1914.....	9	11½	20½
Oct. 21, 1914.....	8½	9½	20½
Dec. 12, 1914.....	7½	8½	20½
Aug. 17, 1915.....	8½	10½	24½
Dec. 14, 1915.....	9½	11½	27½
Mar. 27, 1916.....	11½	13½	34
May 6, 1916.....	13½	16	35½
Oct. 11, 1916.....	15½	17½	45
Oct. 3, 1917.....	16	18½	53
Apr. 26, 1918.....	16	18½	60
Aug. 9, 1918.....	16½	19	63
Dec. 3, 1918.....	20½	24	85
Apr. 18, 1919.....	17½	20½	62
Aug. 11, 1919.....	19½	23	70
Nov. 3, 1919.....	22½	29½	87
Feb. 20, 1920.....	30½	39	90
Mar. 31, 1920.....	36½	47	98
Sept. 10, 1920.....	30	35	94
Nov. 19, 1920.....	23½	27½	78
Feb. 3, 1921.....	18½	21½	60
May 16, 1921.....	15½	18½	50
Sept. 13, 1921.....	16½	19½	50
Apr. 7, 1922.....	14½	17½	42
July 8, 1922.....	13½	15½	42
Dec. 2, 1922.....	12½	14½	39
Apr. 19, 1923.....	12	13½	38
Aug. 29, 1923.....	11½	12½	38
Mar. 15, 1924.....	11½	14	44
Feb. 20, 1925.....	11½	13	44
May 22, 1925.....	12½	15	46
Jan. 20, 1926.....	12½	14½	38
Aug. 14, 1926.....	12½	14	36
Dec. 22, 1926.....	11½	13	35
Nov. 23, 1927.....	12	13½	36
Dec. 20, 1928.....	12	13½	34
Nov. 9, 1929.....	10½	13	34
Jan. 6, 1930.....	11½	13½	34
June 26, 1930.....	10½	12½	31
Feb. 5, 1931.....	10½	12½	28
Apr. 17, 1931.....	10½	12½	27½
Aug. 17, 1931.....	11½	14	27½
Oct. 30, 1931.....	11½	13½	27½
Apr. 5, 1934.....	11½	14	

: Less 20 and 1¼ percent.

4. The mark-up on imported nets and nettings

In its valuation investigation in 1931 and 1932 under section 340 of the Tariff Act of 1930, the Tariff Commission collected information from which the importers' mark-up¹⁷ on imported nets and nettings was deduced. The investigation covered 11 large importers and wholesalers who during the period July 1, 1927, to June 30, 1929, imported nets and nettings to the value of \$2,234,150, or 44.32 percent of all nets and nettings imported during that period. Information was obtained on five kinds of nets and nettings: Ordinary nets of cotton, silk, and rayon, as well as "illusion net" and point d'esprit.

The investigation revealed the following average mark-ups for the 11 firms: Cotton nets, 13.08 percent; silk nets, 20.68 percent; rayon nets (which were somewhat of a novelty during 1927 to 1929), 39.61 percent; point d'esprit nets, 20.55 percent; and bridal illusion nets, 79.62 percent. The weighted average mark-up for all nets and

¹⁷ The mark-up is the percentage added by importers to the landed cost to obtain the selling price.

nettings was 17.3 percent, the average mark-up by firms varying from 6.77 percent for a firm receiving goods on consignment to 44.39 percent for a high-class general lace house.

It will readily be seen that the average mark-up on cotton nets, which constitutes the bulk of American importation is low as compared with the average mark-up on Levers laces. The reason for this is that cotton nets are not fashion products, the demand for them is more or less steady, they have no patterns, and must sell on the general strength, color, and finish; competition is therefore keen and profits are pared down, larger profits from other lace products making up the deficiency. The mark-up on silk nets is quite low; that on rayon nets is fairly high, owing to their novelty and fashion during the period. The mark-up on illusion nets, which are subject to a limited high-class fashion demand, is very high. The bulk of the trade is done on a few numbers; one importer, who carried 32 specimens of various materials and qualities, obtained 75 percent of his business from 5 of them.

XI. COMPETITIVE ECONOMIC ADVANTAGES AND DISADVANTAGES OF THE DOMESTIC BOBBINET INDUSTRY

The domestic bobbinet industry, producing a product of simple manufacture for which there is a relatively steady demand, has never grown to a commanding position in the domestic market. In examining the situation it is found that competitive advantages enjoyed by the domestic industry consist chiefly of location in the consuming market and the completion of all manufacturing processes in one mill.

Compared with these advantages the domestic industry is faced with a number of economic disadvantages. In the first place, bobbinet machines are heavy and expensive and must pay heavy transportation charges and tariff duties; the initial cost of establishing a bobbinet mill in this country, therefore, is relatively high. Secondly, certain of the finer counts of brass-bobbin yarns must be imported from Great Britain, paying tariff duties upon entry into this country. Thirdly, the British industry has a very great advantage of mass production in large factories, whereas the domestic production units, as well as the total number of machines in the country, are very small; however, the smallness of the domestic industry, in the light of the rate of duty which has been accorded for over 40 years, must be considered primarily a result and secondarily a cause of the inability of the domestic industry to compete. Fourthly, the conclusion cannot be escaped that the British industry, with the initial advantage of lower overhead charges, has developed throughout more than a century an economy, skill, and efficiency in the production of bobbinets which renders it superior in the world market. This superiority cannot be attributed to low labor costs; British wages are higher than those paid in France, and yet the latter country competes poorly with Great Britain in foreign markets.

The difficulties of the domestic bobbinet industry in regard to an adequate supply of skilled labor are minor as compared with those of the Levers and Nottingham lace-curtain industries. Bobbinet twisthands in domestic mills are American-born and are taught their trade with comparatively little difficulty. Domestic manufacturers, however, have the difficulty of retaining competent twisthands during

depressed periods and at times are forced to operate at a loss in order to keep intact a body of workers. Again, however, these disadvantages are primarily a result and secondarily a cause of the inability of the domestic industry to compete.

XII. TECHNICAL PROCESSES OF MANUFACTURE ¹⁸

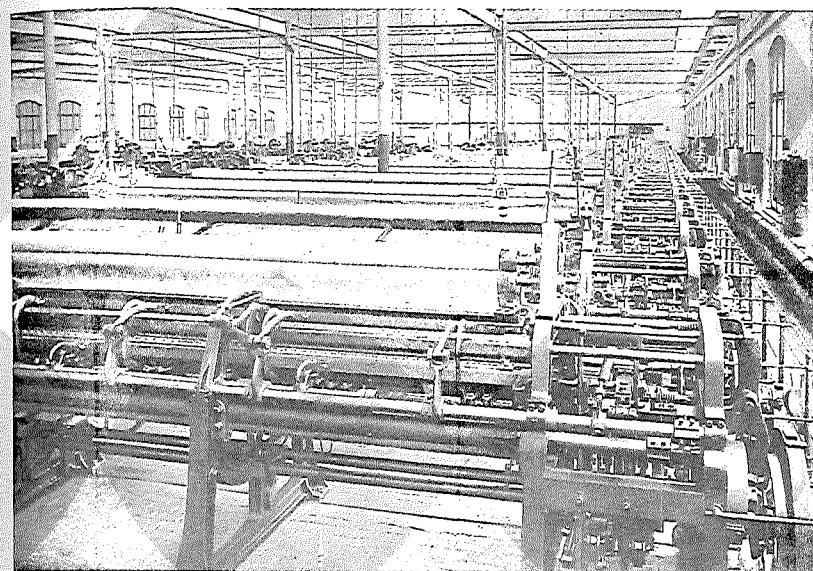
1. Description and operation of the machine

The bobbinet machine was the first of the various types of lace machines to be invented, and the modern plain net machine of 300 inches or more in width differs in principle in no way from John Heathcoat's second bobbin lace machine 18 inches wide, patented in 1809. In general appearance the machine is very similar to the Levers lace machine, but it is not so high, no platform is needed, and there is no jacquard; it is, however, built much wider, ranging up to 340 inches. There are two kinds of bobbinet machines, the rolling locker and the double locker. The rolling locker makes net the full width of the machine; the double locker, in addition, makes the insertions known as quillings or footings. The carriages in the double locker machine are moved by clawers under the carriages; those in the rolling locker are moved by revolving corrugated rollers which extend from end to end of the machine and fit into teeth cut in the bottom arc of each carriage; catch bars are thus eliminated. There are two rows of carriages in both types of machines. The extent of the inner arc radius of the comb bars is from 6 to 8 inches, and the thickness of a 14-point carriage is 1.4 millimeters (0.055 inch).

A bobbinet machine makes the following automatic motions: (1) Displacement of the warp bars from right to left, and vice versa; (2) forward and backward motion of the carriages with periodic displacement of the front comb bar to right and left, whereby the carriages are also displaced sideways; (3) the fastening of the inserted bobbin threads by pushing them upward to their proper positions by the point bars, thus consolidating the work; (4) the winding up of the completed fabric over a fixed work roller.

The front comb-bar is movable and is "shogged" by the action of cams, fixed at the end of the machine, every third revolution of the carriages, when all the front row of carriages is moved 1 gait to the right; at the second half of the same revolution the bar shogs again, and the carriages of the back row are moved 1 gait to the left, thus crossing the bobbin threads. These movements leave 1 carriage in a stationary comb over the well at each end of the machine. After 2 revolutions, the stationary carriage at the right-hand side of the machine is moved over to the back comb-bar, and the 1 at the left-hand side of the machine is moved over to the front comb-bar. This movement is effected by a roller underneath the ends of the well of the machine, which presents a corrugated surface to the base of these 2 carriages every third revolution. Thus the carriages travel to the right along the front comb-bar and one by one are transferred to and travel to the left along the back comb-bar, to reappear in time at the front again, thus making a complete circuit of the machine. As the carriages work in opposite pairs, there are always 2 of them in 1 comb in either the back or the front comb-bar.

PLATE 11



BOBBINET MACHINE.

¹⁸ The technical details here given of the making of bobbinet have not heretofore been available in published form. They will furnish the reader some idea of the complexity and importance of the operations of the machines.

The warp threads are a series of parallel threads, working perpendicularly and running lengthwise to the piece; the 2 sets of bobbin threads run diagonally to the length of the piece from opposite sides and are traverse weft threads. During the 2 revolutions when the comb-bar is stationary, the warp threads are moved over 1 gait, to twist with the bobbin threads. Each bobbin thread as it encounters a fresh warp thread in its journey up the front and down the back comb-bars, twists around the warp threads, whence the name "twist net", which has been given to bobbinet. The material is made by the pendulum and lateral movement of the bobbin threads, together with the lateral motion of the set of warp threads. The combination of the crossing of the bobbin threads and the twisting of the bobbin threads with the warp threads forms a knot which does not slip. Any irregularity in the bobbin yarn shows as a slanting streak, and this accounts for the "criss-cross" appearance of the net.

The following quotation is taken from Felkins' standard work on the subject:

When the shifting bars have passed the bobbins which contain the diagonal threads through the longitudinal threads, the comb-bar which receives them on the other side has a lateral motion given to it, equal to the space between two threads. If the bobbins be brought back on the contrary side of each longitudinal thread, each diagonal thread will have made one twist with a longitudinal thread. If, now, the front comb-bar be moved laterally, till each bobbin stands opposite to the space from which it first started, and the threads be again passed through to the back and brought again to the front on the other side of each longitudinal thread, the threads will have been twisted twice.

In domestic mills the machines are driven by individual motors, and the amount of power required varies, according to the gage and size of the machine.

Two machines are set up face to face, and a single twisthand operates them simultaneously, working in shifts in the same manner as the twisthands of the other branches of the lace industry. The rack is 720 double motions in length, each double motion being a complete revolution of the carriages. There are 3 double motions¹⁹ per hole or 240 holes per rack. The quality on the machine can be ascertained by multiplying the holes to the inch along the warp by 3, and dividing into 720 gives the number of inches to the rack. For instance, bobbinet made with 24 holes per inch on the machine

has a quality of 72, and the inches produced per rack are $\frac{720}{24 \times 3} = 10$.

A machine makes about 56 motions per minute, $4\frac{1}{2}$ racks per hour, and between 400 and 500 racks per week of 97 hours. The quantity of material made by a machine can be advantageously increased only by augmenting the width of the machine, as the speed cannot be increased with safety.

The determination of the quality of the finished material by the number of holes per unit of surface is made by counting the holes per English square inch perpendicularly and diagonally and adding the numbers together.

2. The finishing processes

After the piece is taken from the machine, the following processes are necessary: Mending, bleaching or dyeing, dressing, cutting up, inspecting and mending, folding, pressing, ticketing, and boxing.

¹⁹ The hole is now made by 6 single motions, and in Heathcoats original machine it was made by 60.

The mending is done by hand, and the goods are then bleached or dyed ivory, ecru, arabian, or such other colors as may be required. Great skill is required in the dressing; the piece loses considerably in length, but being a fabric of an elastic nature it is dressed much wider than the width on the machine, the result being a distinct gain in square yardage. On the machine the shape of the meshes may be a lengthened hexagon or a rectangle. The meshes are bounded by regular lines, imitating the hexagonal, geometric arrangement characteristic of the honeycomb, and the ascent of the holes to right or left is normally about 30°. The various types of dressing range from the softest waterdress for fine nets, to the stiffness required for the hard nets used for hat shapes, which nets contain 3 or 4 times their own weight in starch, and whose edges cut like a saw. The purpose of all stiffening is to give necessary firmness and to maintain the length and breadth of the piece.

As a rule there are 2 thick threads run down a certain place in the net with 1 warp out between them, where it is cut for dressing purposes, as the full width of the piece would be too wide for the dressing frame and as the goods are sold in 36-, 45-, 54-, 72-, 90-, 108-, or 120-inch widths, these threads are run in such a place as will give, when dressed, widths of a multiple of any of these widths required. The nets are sometimes singed or gassed. The net when finished is laid, folded for the required width, on a table with a cross groove, held in position by a metal clamp, and a mechanical guillotine cuts down the groove through the folds of net.

CHAPTER IV

BARMEN LACE MADE ON THE CIRCULAR LACE-BRAIDING MACHINE WITH JACQUARD ATTACHMENT

I. DESCRIPTION AND USES

Barmen lace is a machine-made imitation of bobbin and cushion hand-made lace¹ (made with exactly the same passings and inter-twisting of threads) and is made on a machine known as "a single-thread, circular braider." The Barmen machine not only reproduces bobbin and cushion hand-made lace with a high degree of perfection, but it imitates a wide range of styles of laces made on other machines, though these imitations are not so exact as those of the hand-made bobbin laces. Needlepoint hand-made lace cannot be reproduced on the Barmen machine.

Although the Barmen laces can be made in imitation of a wide range of hand-made and machine-made laces, employing a great variety of yarns of all materials ranging in count from the coarsest cotton to 120/2, they are made on a principle entirely different from that upon which Levers laces are made. The Barmen machine does not produce the fabric by the intertwisting of warp, beam, and brass bobbin threads, but by the braiding of threads from individual spindles. It is not capable of turning out so wide a variety of styles as the Levers machine, nor can it use yarns as fine as the Levers machine; neither can it make doilies or detached objects of different shapes. However, improvements and adaptations of the machine appear periodically which give it constantly increasing versatility.

The greater number of Barmen laces are made in the Cluny style, but some are made in torchon (practically a lightweight Cluny), in Guipure (distinguished by purl effects), in filet, and in the Binche and Valenciennes styles. In addition, there is a small output of an imitation of Point de Venise, an elaboration of which is patented in France. Among other adaptations may be mentioned the British patent no. 16543 of 1912 for making floating Cluny spots. In the past, Barmen laces have usually carried geometrically shaped objects, but patterns are now produced which include floral objects.

It would not be proper to consider Barmen lace entirely as a slavish imitation of hand-made lace. Very different methods of construction are employed by the machine to achieve the effects of handwork, and new effects often are produced which have no different style name but which lend to Barmen lace a distinctive character.

Barmen laces ranging in width from one-half inch to 5 inches are produced mainly as edgings, and to a lesser extent as insertions and galloons. About 5 inches is the maximum width which can be made on a Barmen machine; this width may consist of one breadth of lace or of several narrower breadths made simultaneously.

¹ A firm of foreign manufacturers, who are also New York importers, have issued a card showing samples of the same pattern of hand-made lace side by side with Barmen imitation; it is almost impossible to distinguish the imitation from the real.

Barmen laces are chiefly upholstery laces, used to edge or ornament curtains, doilies, tablecovers, centerpieces, runners, and furniture coverings. For such purposes they are made of coarse yarns. Made of somewhat finer yarns, they are used for millinery, as edgings for underwear, and for the ornamentation of dresses. Barmen laces are so much more durable than Levers laces that they have displaced the latter (and even hand-made laces) for some purposes. One great advantage which they possess over the product of the Levers machine is that they are perfectly finished as they come from the machine, requiring no clipping or scalloping; consequently there are no raw edges that can fray, and they will stand repeated washing. A prominent importer exhibits samples which after being laundered 100 times show no indication of the thickening which so often appears in lace after it has been washed.

II. DEVELOPMENT AND PRESENT SCOPE OF THE DOMESTIC INDUSTRY

The forerunner of the Barmen lace machine, called "La Dentellière," was invented in France in 1872 but was not perfected to produce commercially. In 1894 the principle was adapted to the braiding machine. The patent rights were very quickly sold in England and in Germany. It is in the latter country that the production of Barmen lace has enjoyed its greatest success, although large Barmen lace industries are found in France, England, and the United States. Barmen lace receives its name from the town of Barmen, Germany, the center of German production; in France it is sometimes known as a torchon lace.

The growth of the Barmen lace industry in the United States has been aided by the fact that more than any other branch of the lace industry it is adapted to the system of mass production. The output of a Barmen lace machine is so small that it is necessary to operate a considerable number of them in order to yield a profit. The range of patterns is limited when compared with the number made on the Levers machine, and large quantities of the same patterns are produced.

In the United States the manufacture of Barmen lace was attempted at Schenectady early in the twentieth century. The same firm started operations again at Bridgeport, Conn., in 1910, and the plant is still in operation though under different proprietorship and management. At the present time there are 3 producing firms, 1 in Connecticut and 2 in Pennsylvania. The total number of machines in operation in the United States is 955; the mill in Connecticut operates 525, and 2 mills in Pennsylvania operate 430 machines. In one instance the machines form part of a plant for the production of smallwares and in another case the holding firm operates Levers machines and narrow fabric looms. The number of machines in operation at the present time (1933) is substantially less than the number in operation at the time of the Tariff Commission's investigation in 1924, at which time there were 7 firms with 1,069 machines in operation. The Commission in its investigation obtained data from 4 firms operating 949 Barmen machines, totaling 45,764 spindles. Six hundred and eleven of these machines were imported from Germany,² 245 were built by a domestic firm of textile machinists, and

² Lace-braiding machines were first mentioned separately in the Tariff Act of 1922, dutiable under par. 372 at 40 percent ad valorem; the same rate prevailed in the same paragraph in the act of 1930.

93 were built by the operating firms; 410 machines had 44 spindles each, 198 had 52 spindles each, 148 had 36 spindles each, 107 had 64 spindles each, and there were a few machines of 40, 48, 56, 60, 68, 72, 76, and 80 spindles each. The smallest domestic machine had 36 spindles and the largest 80.

The present condition of the Barmen lace industry, both in the United States and abroad, is unsatisfactory, because of the passing of the vogue for this type of lace and the competition of Chinese hand-made laces. Within the last 9 years four domestic firms have gone out of business.³ In the last few years bankruptcies have been numerous in Barmen, Germany; the largest firm has changed hands, and one of the most prominent manufacturers has retired. In 1930 a temporary impetus was given to the business by the demand for hemp braids utilized for hat shapes, but this fashion demand was soon filed and the industry again suffered.

Tariff history

The separate classification of laces according to the type of producing machine is not general in the recording of imports. Imports of the products of the Nottingham lace-curtain machine have been separately recorded from 1897, and of nets and nettings from 1912. Imports of Levers machine-made laces were separately recorded under the Tariff Act of 1909, and are so recorded under the act of 1930. In the year 1933 imports of Lyons Alençon laces of cotton were separately recorded but the practice was discontinued in 1934. Barmen laces were not produced at all until about 1894 and imports of them have never been separately recorded. From 1912 onward they have been included under the classification of machine-made laces. Under the Tariff Acts of 1909, 1913, 1922, and 1930, imports have been assessed at the same rates of duty as other machine-made laces (with the exception of Levers machine-made laces under the act of 1909), the rates of duty being 60 percent ad valorem under the first 2 acts mentioned, and 90 percent under the last 2 acts.

III. ORGANIZATION, EQUIPMENT, AND MATERIALS

In addition to the Barmen lace-braiding machine itself, the special equipment required in a Barmen lace mill consists of spool-winding machinery, a punching machine, a card-lacing machine, and jennying machines. The expert help consists of a draftsman, a card puncher, and girls or men to supervise the operation of the machine. One operator can look after 1,200 spindles, and it is customary for him to supervise 20 or more machines. A small number of workers are required to wind yarns from the skein onto the spools, this being the only yarn preparation required. Only a small number of workers, therefore, are required to carry on all the processes in a large Barmen lace mill.

The materials used in making Barmen laces are cotton, flax, rayon, and silk yarns, and metal threads. Practically all Barmen laces made in domestic mills are of coarse, combed, cotton yarns, chiefly of domestic manufacture, ranging in count from 6/2 to 20/2; these yarns are bleached and mercerized before they are spooled, the largest firms carrying out these processes on their own premises. A

³ Their machines were bought at low prices by some of the remaining firms and scrapped.

few patterns are made of finer yarns, 78/2 being imported. Some 3-ply yarns are used, the counts ranging from 18/3 to 60/3. Sometimes more than one count of yarn is used in the same pattern. Linen thread of 30/3 lea, tinsel thread of 7s, and rayon of 150/2 and 300/2 deniers are also used. Various colors of rayon yarns are used in the same pattern; insertions may be made with edges of one color and the center of another; two or more breadths made at the same time can be of different colors. The use of Barmen laces as braids for hat shapes induced the use of artificial horsehair, pedaline, and hemp, but braids of these materials have only a very sporadic and fleeting demand.

Almost all grades and types of Barmen lace, except the very finest, are produced in domestic mills. The great bulk of the output, however, is in medium and coarse grades in which the American manufacturers dominate the domestic market. The length of production per hour decreases with an increase in fineness of yarn, consequently high-grade laces made in narrow widths requiring fine yarns and a large number of machine motions in 10 centimeters, are rarely made in the United States.

The output of a machine per hour is small, but immeasurably greater than the amount of real lace made by hand in the same time. The length of lace the machine makes per hour depends upon the quality, which is based upon and calculated from the number of motions in 10 centimeters (3.937 inches). This mode of reckoning is analogous to that adopted for the products of the Nottingham lace-curtain machines, where the quality is indicated by the number of motions in 3 inches of work. The quality of lace made on the Levers or bobbinet machines, on the other hand, is stated by the number of inches in a rack of a fixed number of motions, the very opposite of the principle used here, where the length is invariable and the number of motions changes. In the production of Barmen lace there is no standard of unit, of a given number of motions, similar to the "rack" in Nottingham lace-curtain, Levers, or bobbinet machine products. The rate of production is slow, and the length made per hour depends upon the quality. The machine makes from 140 to 180 motions per minute, the average being 160. The German wage list makes provision for qualities ranging from 75 to 1,000 motions per 10 centimeters, and taking the average figure, 160, as the standard motions per minute the theoretical production (without allowance for stops) with 75 motions per 10 centimeters is 14 yards per hour, and with 1,000 motions per 10 centimeters is 37.8 inches per hour, such lengths being multiplied by the number of breadths of lace made at the same time.

IV. DOMESTIC PRODUCTION AND FOREIGN TRADE IN BARMEN LACES

1. Domestic production

Domestic production of Barmen laces was first recorded in the census returns of 1919. It has been recorded only 2 years since that date, 1925 and 1927. Such statistics as are available are shown in table 119. As is evident from the statistics here presented, production, in terms of quantity, in 1925 was less than half that in 1919, but the unit value of Barmen laces in 1925 was twice as great as the unit value in 1919, indicating wider lace or better quality.

TABLE 119.—*Braided laces: Production, census years, 1919-31*

Census year	Linear yards	Value	Unit value
1919.....	101,663,950	\$1,886,470	\$0.0186
1921.....	(1)	(1)	(1)
1923.....	(1)	(1)	(1)
1925.....	45,405,305	1,718,237	.0378
1927.....	34,083,112	1,192,373	.0350
1929.....	(1)	(1)	(1)
1931.....	(1)	(1)	(1)

¹ Not available.

2. Imports and exports

Imports and exports of Barmen lace are not separately recorded in official statistics, imports being included with imports of all other machine-made laces, and exports are probably negligible in quantity and value, being included in statistics of exports of cotton laces and embroideries. Inasmuch, however, as practically all imports of Barmen lace are from Germany and inasmuch as practically all cotton machine-made fancy laces imported from Germany, except embroideries and burnt-out lace (separately classified), consist of Barmen laces the records of the United States consulate at Barmen, Germany (for the pre-war and war period), and at Cologne, Germany (for the post-war period), showing registrations of cotton lace and lace articles for exportation to the United States, afford fairly adequate statistics concerning American imports of Barmen laces.⁴ The following tables tabulate cotton machine-made lace and lace articles declared for export at the American consulate at Barmen and Cologne.

TABLE 120.—*Statistical compilation covering exports of Barmen lace to the United States from the records of the American consulate at Barmen, Germany, 1910-17*

Year	Value	Year	Value
1910.....	\$977,179	1914.....	\$967,494
1911.....	1,389,524	1915.....	520,872
1912.....	1,294,517	1916.....	237,886
1913.....	1,206,584	1917 ¹	34,000

¹ Jan. 1 to Feb. 10.

TABLE 121.—*Exports of cotton lace and lace articles to the United States, as recorded by the American consulate at Cologne, Germany, 1922-32*

Year	Value	Year	Value
1922.....	\$229,832	1928.....	\$103,169
1923.....	309,723	1929.....	51,573
1924.....	601,994	1930.....	32,457
1925.....	249,308	1931.....	22,772
1926.....	138,053	1932.....	16,641
1927.....	179,066		

¹ Machine-made laces.

⁴ Barmen laces for export to the United States were consulated at Barmen, Germany, until Feb. 10, 1917, at which date the American consulate withdrew from Germany; since the war Barmen laces exported to the United States have been consulated at Cologne, Germany, records dating from Dec. 5, 1921.

3. Relation of domestic production and imports to consumption

Table 122 shows, for 1925 and 1927, the domestic value of braided laces, as recorded by the Bureau of the Census and the landed (duty-paid) value of imports from Germany consulated as cotton laces and lace articles. These data are presented only as an indication of the competitive status of production and imports in those years. After 1927, imports declined steadily, but lack of domestic production data prevents any statistical comparisons.

TABLE 122.—Domestic production of Barmen laces compared with German exports of cotton laces to the United States consulated at Cologne, Germany, 1925 and 1927

Calendar year	Landed value of imports ¹	Domestic production	Apparent consumption	Percentages of consumption	
				Imports	Domestic production
1925.....	\$492,383	\$1,718,237	\$2,210,620	22.27	77.73
1927.....	353,655	1,192,373	1,546,028	22.88	77.12

¹ Dutiable value plus 90 percent duty and 7½ percent landing charges.

V. FOREIGN PRODUCTION

1. Germany

The type of fancy braid known as Barmen lace originated in France. It has, however, reached the zenith of its production in Germany, in the Wupper Valley, particularly at the town of Barmen, which is the world center of the braiding industry. The number of Barmen lace machines in this district is about 4,000, and the firm which in 1894 purchased the original German patent rights now operates 1300 machines, comprising 65,000 spindles, or 32½ percent of the total. Some of the machines are larger than any used in the United States, being of 104, 108, and 124 spindles each. The machines can be obtained from textile machinists in Barmen, but the largest producers of the laces build their own machines. Some of the German manufacturers are of the opinion that the machine has reached the limit of its possibilities and do not seek new developments. However, refinements are constantly being patented and added to the basic machine. Among these may be mentioned an attachment which enables lacers to be dispensed with in the holding out of purls in the net or the body of the pattern, a real economy, eliminating hand labor; and another which increases the output of the machine by 20 to 25 percent. Many of the German firms making Barmen laces also have other types of textile machinery, and produce 2-, 3-, or 4-thread laces, braids, shoelaces, and ribbons.

Before the World War German production of Barmen laces was chiefly of linen thread, but since the war, it is made chiefly of bleached, mercerized cotton. At first the best American variety of long-fiber cotton was imported and mercerized in Germany for the making of Barmen laces, but as the price of cotton rose higher after the year 1921 recourse was had to poorer grades; at the present time in Germany, East India cotton, being the cheapest of all varieties of cotton, is used predominantly for coarse Barmen laces. Cotton yarns of counts 6/2 to 32/2 and from 36/3 to 120/3 are used, with a small amount of fine cotton yarn from 80/2 to 120/2 for making imitations of Valenciennes laces. Pattern numbers of German Barmen laces are usually preceded by a letter indicating the count of yarn used in making that particular

pattern. According to this system, the letter C indicates 6/2, E indicates 8/2, G indicates 10/2, and L indicates 16/2.

The value of technical training is recognized by the authorities. The industrial school, "Preuss Hoehere Fachschule fuer Textil-Industrie" contains some Barmen lace machines which are used for practical demonstration of the craft, and a special branch of the curriculum consists of a course in designing and drafting, where, in addition to the technicalities of the trade, effort is made to develop originality and to teach the adaptation of each passing whim of fashion to the products of the machine.

The largest manufacturer in Barmen owns the factory in which his business is carried on, and derives power from his own boilers, during the summer months, but in the winter uses the boilers for furnishing heat to the plant, and obtains electric power from the town's supply. All processes, from the winding of the raw material to the boxing of the finished lace, are carried out on the premises. There is a German Imperial tax of 2½ percent on the turnover of the business, but this tax is remitted on shipments to foreign countries.

The German industry is operated 6 days of 24 hours each, per week, or a weekly total of 144 hours; the work is carried on in three 8-hour shifts per day, each person being employed 48 hours per week. This is intensive production; by adopting it the German manufacturers struck out on a new line of their own. They took an infant industry and organized and established it upon a basis of large production, with all the attendant advantages of ability to purchase raw material on a low market, of long runs on the same pattern, thus eliminating frequent loss of time through changes in pattern, and of costs scientifically worked out and reduced to a minimum. They were the first in the field with a new and attractive article of general utility and undoubted wearing qualities, which was widely advertised by the distribution of samples, and by obtaining command of all markets for a time they defied competition.

2. France

The Barmen lace machine is of French origin. As early as 1872 a patent was taken by a French engineer, Eugene Malhère, to make "real hand-made lace" by machinery. It was not until 1894, however, that the machine was perfected to produce lace on a commercial basis. The sons of the original inventor still operate a factory containing 500 machines at Beaumont-le-Roger, Eure, and there are other plants scattered throughout Normandy. The largest development of the business has taken place since the war, at Le Puy en Velay, the capital of the Department of the Haute-Loire, where there are now 60 firms and over 2,000 machines; these manufacturers are members of the Chambre Syndicale des Fabricants de Dentelles et Passementeries de la Haute-Loire. There is a certain logic in the establishment of a Barmen lace industry at Le Puy; for centuries it has been the center of a district for the production of hand-made laces, mainly of a heavy type and similar in appearance to Barmen laces. The Le Puy manufacturers claim that they are in a superior position to other manufacturers on account of being stationed at a hand-made lace center, which gives them advantages of observation of design and style.

A certain number of the machines at Le Puy have been imported from Germany, but they are now built in the town by a French textile

machinist. In 1924, machines purchased in Le Puy cost 220 francs per spindle; at the same time machines purchased and imported from Barmen, Germany, cost 180 francs per spindle, plus 50 francs freight, or a total cost of 230 francs per spindle. The factories are not of the size of the German establishments, as will be judged from the total number of firms which own 2,000 machines; some of them, however, operate as many as 160 machines and the capacity of the machines extends to 88 spindles. Some factories have the advantage, as has the factory at Beaumont-le-Roger, of being operated by water power.

The French Barmen lace industry is operated 144 hours per week. The factories at Le Puy commence work at 6 a.m. on Monday morning and continue without intermission until 6 a.m. on the following Sunday morning.

The articles made at Le Puy embrace coarse-yarn laces and other laces using yarns as fine as 40/2 or 60/3. The mill at Beaumont-le-Roger has a certain output of fine yarn laces. In general, the French production is of somewhat better quality than the American-made laces of the same designs.

A large increase in the size of the French industry since the war is due to the fact that since 1918 the French Government has levied a high tariff on importations of German lace, and whereas formerly this lace was imported by the French merchants from Germany, the French manufacturers now supply the demand. Under the new act the duty was assessed by weight, but according to this arrangement, the best quality, which weighed the lightest, being of the finest yarn, was admitted to the country at the lowest duty. On protest by the French manufacturers, the bases of assessment was altered and Barmen lace is now dutiable at three qualities, low, medium, and high, at 20, 40, and 60 percent ad valorem, respectively. Only small quantities of Barmen lace are exported from France.

3. England

The patent rights for the Barmen lace machine, for the British Isles, were purchased by a large and old established firm in Nottingham which manufactured high-class Levers laces and Nottingham lace curtains. This firm installed several hundred machines and until the expiration of the patent rights, enjoyed a monopoly in the British Isles. In accordance with their common and enterprising policy they affiliated themselves with the French inventors of the original machine and interchanged with them ideas of mechanical improvements; later they were on the same reciprocal basis with the largest firm in Germany. The articles manufactured are largely of yarns of fine count, and include excellent examples of Valenciennes and Point Binche lace. Since the expiration of the patent, other firms of Barmen lace machine holders have come into existence in the neighborhood of Nottingham, notably at Loughborough in Leicestershire. It is estimated that there are 1,250 machines in England built either by the textile machinists of Nottingham or the operating manufacturers.

A duty of 33½ percent was levied on Barmen laces imported into Great Britain under the provision of the Safeguarding Act as of July 1, 1925.

4. Other countries

Small plants of Barmen lace machines are operated in other European countries, notably Belgium, Holland, and Italy. The plant in the last-named country is important; it comprises 15,000 spindles and is operated by a large German firm located in Barmen; the product is used entirely for the Italian trade and does not enter into international competition.

No data are available as to the quantity or value of foreign production of Barmen laces, but judging from the estimated number of machines, Germany leads and is followed by France and the United Kingdom.

VI. SUBSTITUTES FOR BARMEN LACES

Barmen laces are advertised as, and are in fact, imitations of certain styles of hand-made European laces, particularly Cluny and torchon. Because of their lower cost of production the machine-made laces have been used as substitutes for hand-made laces. In recent years, however, the situation has been reversed. The large hand-made lace industry in China, which has put hand-made laces on the domestic market at prices lower than those for machine-made goods, has affected seriously the sale of Barmen laces; not only have the Chinese handmade laces replaced to some degree their machine-made imitations, but they have been used as substitutes for some of the distinctive, higher priced Barmen laces. The importation of Chinese hand-made laces into the United States is discussed in chapter VI.

VII. WAGE DATA

Unlike the method of payment for the operation of other types of lace machines, which are paid by the rack, the operation of Barmen machines is paid by the hour. The domestic industry was formerly operated 143 hours per week, from midnight Sunday to 11 p.m. Saturday, but under the N.R.A. code, for the lace-manufacturing industry, the machine hours are restricted to 80 per week.

Operators in foreign Barmen lace mills are also paid by the hour. The following table shows the average hourly and weekly wage rates paid in 1924 for certain identical operations in the domestic and German industries:

TABLE 123.—Wages paid in domestic and German Barmen lace mills in 1924

Operative	Domestic mills		German mills ¹		Ratio of American wages to German wages, taken as 100
	Per hour	Per week of 48 hours	Per hour	Per week of 48 hours	
Foreman.....	\$0. 7150	\$34. 32	\$0. 2481	\$11. 91	288
Machine operators.....	.3900	18. 72	.1489	7. 15	262
Cleaners and oilers.....	.3900	18. 72	.1489	7. 15	262
Card puncher.....	.3280	15. 74	.1242	5. 96	264
Winding foreman.....	.6000	28. 80	.1986	9. 53	302
Spool winders.....	.3400	16. 32	.0992	4. 76	343
Spool carriers.....	.3300	15. 84	.1242	5. 96	266
Menders.....	2. 2550	12. 24	.0992	4. 76	258
Ironers.....	2. 2650	12. 72	.0992	4. 76	267
Jennys.....	2. 2200	10. 56	.0992	4. 76	222

¹ Conversion of German currency to United States currency is made at par value of the gold mark, \$0.2382.
² These rates have been advanced to 32½ cents per hour under the Code for the Lace Manufacturing Industry, N.R.A.

While the domestic wage rates shown in table 123 for 1924 remained stationary until 1928, German wage rates changed a number of times. In August 1925 wages at Barmen, Germany, were advanced 20 percent and on January 1, 1927, there was a further advance of 5 percent. On March 30, 1928, wages in German Barmen lace mills were again increased. The wages put into effect at that time were as shown in the tabulation below. These wages were, for male workers, 40 to 50 percent higher than wages paid in 1924, and for female workers, 30 to 42 percent higher.

TABLE 124.—*Wages paid in the Barmen lace industry in Germany in 1928*

Skilled laborers 20 years of age and over:

Men, 80 to 90 pfennigs, 19 to 21½ cents per hour.

Women, 56 to 62 pfennigs, 13½ to 15 cents per hour.

Unskilled laborers, both sexes, 20 percent less.

Youths, both sexes, under 20 years of age:

19 years, 80 percent of adult wages of respective sex.

18 years, 70 percent of adult wages of respective sex.

17 years, 60 percent of adult wages of respective sex.

16 years, 50 percent of adult wages of respective sex.

15 years, 40 percent of adult wages of respective sex.

14 years, 30 percent of adult wages of respective sex.

An official German emergency decree of December 8, 1931, provided for a 10 percent reduction in all contractual wages, rentals, etc. An additional decree of April 30, 1932, provided that contractual wages and salaries should be reduced to the level of January 10, 1927.

VIII. DOMESTIC COST DATA

The variable factors inherent in Barmen laces are style, yarns, weight of unit, spindle count, quality, width, and finish; these require consideration when the goods are analyzed for the purpose of obtaining the cost of production. The custom which obtains of making in different mills, patterns identical in every particular, except perhaps quality and weight, removes some of the difficulties. The weight of a specific length of Barmen lace depends upon the pattern, the yarn count, the spindle count, and the quality; and the quality may be different in patterns which appear to be alike. The Bureau of the Census in publishing details of production in the cotton industry divides cotton yarns into coarse yarns, 1 to 20; medium yarns, 21 to 40; and fine yarns above 40; and this classification may be used for Barmen laces.

Table 125 shows details of average cost of production in 1924 of 21 coarse Barmen laces, 16 to 76 spindles, 6/2 to 16/2 cotton yarns, 111 to 200 quality, 0.0623 to 0.7917 of a pound per dozen linear yards, and seven-eighths inch to 4½ inches in width; and of 2 medium Barmen laces, 22 and 32 spindles, 24/2 and 30/2 cotton yarn, 0.0770 and 0.0624 of a pound per dozen yards, and eleven-sixteenths and thirteen-sixteenths of an inch in width.

TABLE 125.—*Average cost of production of domestic Barmen laces in 1924*

[Unit per dozen yards]

Yarn count	Costs					Percentage of total cost		
	Average weight	Material ¹	Labor	Manufacturing expenses	Total mill cost	Material	Labor	Manufacturing expenses
Not exceeding 20.....	Pounds 0.2910	\$0.1970	\$0.0798	\$0.1250	\$0.4018	49.03	19.86	31.11
21 to 40.....	.0697	.0631	.1324	.1646	.3601	17.52	36.77	45.71

¹Net cost of yarn including waste.

IX. FOREIGN COST DATA

German costs

At the time when the Tariff Commission obtained cost data of Barmen laces the German manufacturers of Barmen laces were, with one exception, associated together in the "Verband der Fabrikanten maschinengekloppelter Spitzen e.V." A very definite relationship was established between each firm and the association, and a sample of each lace made, accompanied by details of the cost items, was lodged with the secretary. The association issued a book in 1921, which was supplied to its members, containing full explanations of the association's basic system of computing costs. This system was universally used until January 1, 1924. After that date although the manufacturers were still members of the association, and adhered to such decisions as were reached on questions of policy concerning labor and other factors, they were at liberty to compute the costs of their products and mark the selling prices according to their own wishes; but the majority of the manufacturers continued calculations on the lines of the principles in force before January 1, 1924.

The basic principles of the German association's cost system, outlined in the succeeding paragraphs, were adopted as a result of long years of practical experience.

The weight of material in a piece is calculated from the length of yarn, in 10 centimeters of a pattern, which must contain at least one full repeat of the pattern. The threads comprising 10 centimeters are carefully pulled apart and measured exactly, each count of yarn being taken separately; the total length of each count is multiplied by a stated factor for 1,000 meters, and the result is multiplied by a second factor for the price of the yarn count, the sum of the totals gives the cost of the yarn in 1,000 meters, including the waste made during the production of the lace.⁵ A definite percentage of loss of weight of material is allowed for the process of bleaching; this varies from 5 to 8 percent according to the count of yarn, the heavier yarns having the larger percentage of loss. Long experience has demonstrated that a definite price can be fixed for the cost of yarn for each lacer per 1,000 meters.

The labor charge per 1,000 meters is fixed according to a schedule, which is graduated according to the number of cards in 10 centimeters

⁵ This method of calculating the yarn cost, in lieu of the simple method based on the ascertained weight of the lace, has an advantage when the lace consists of two counts of yarn of different prices. Weighing the lace would give no estimate of the proportions in which the different yarns were used, but according to this method the segregation of the different yarns in the 10 centimeters enables the percentage of each in the given portion to be ascertained.

of lace and the number of spindles in the machine, and extends from 75 cards to 1,000 cards and from 6 to 120 spindles. These prices are increased, for additional cards in the 10 centimeters in definite multiples of 5, 10, 15, 20, 25, 30, 40, 50, 60, 70, and 100, and apply to laces made of cotton and linen threads. The rates are increased 60 percent for laces made of silk and artificial silk. The great economic upheaval which took place in Germany after the war, necessitated various adjustments of labor rates; the original figure is multiplied by a determined factor, in order to bring the wage scale up to the requirements which are proportionate to the increased cost of living.

This scale, known as the spindle-hour rate, includes in addition to all manufacturing labor, a percentage for operating factory expense, calculated by dividing the operating factory expense for a week, of a mill of a certain number of spindles, by the number of spindles in the mill, which being divided by the hours worked per week is added to the wage rate to give the spindle-hour rate. Definite charges are fixed for drawing, mending, jennying and calendering, and for putting up and finishing. There is a deduction for rough finishing and an additional charge for finishing smaller quantities than 20 meters. The lace is sold by linear length, or by the piece, and not by weight.

There are different minimum selling prices for Germany, the United States, Great Britain, Holland, France, Italy, and other countries, a varying percentage being added to the cost of production. The difference between the cost of production and the selling price includes a group of expenses—ordinary discount, cash discount, commission and cash bonus, turnover tax (domestic trade only), association subscription, general expense, and profit. For England and the United States only, freight and insurance are added. Quotations are made per hundred meters, except those for England and the United States, which are made per gross (144) yards.

Table 126 shows details of average German cost of production in 1924 of 56 coarse Barmen laces, 16 to 64 spindles, 6/2 to 16/2 cotton, 123 to 266 quality, 0.0505 to 0.6291 of a pound per dozen linear yards, and $\frac{5}{8}$ inch to $4\frac{1}{2}$ inches in width; and of 3 medium Barmen laces, 22 to 32 spindles, 24/2 to 30/2 cotton yarn, 326 to 540 quality, 0.0291 to 0.0878 of a pound per dozen yards, and of $\frac{5}{8}$ to $\frac{7}{8}$ inch in width.

TABLE 126.—Average cost of production of German Barmen laces in 1924

[Unit per dozen yards]

Yarn count	Costs					Percentage of total cost		
	Average weight	Material ¹	Labor	Manufacturing expense	Total mill cost	Material	Labor	Manufacturing expense
Not exceeding 20.....	Pounds 0.3356	\$0.2155	\$0.0314	\$0.0430	\$0.2859	73.98	10.98	15.04
21 to 40.....	.0591	.0520	.0684	.0705	.1909	27.24	35.83	36.93

¹ Net cost of yarn including waste.

X. WHOLESALE PRICES

1. Domestic Barmen laces

Prices of Barmen laces made on the lace-braiding machine are affected not only by the physical details of manufacture, such as materials used, number of spindles per machine, and quality, but also by the attractiveness of the pattern and other imponderable factors. For these reasons prices of Barmen laces are not quoted in the trade journals, and the trend of prices over a period of years can be shown only by using prices submitted by individual manufacturers for their typical products. Tables 127 and 128 show the trend of wholesale prices in New York over a period of years for Barmen laces made by two domestic manufacturers.

TABLE 127.—Domestic Barmen laces of cotton: Wholesale price, per dozen linear yards, in New York for years 1918–33

[Data supplied by domestic manufacturer A]

Month and year	22 spindles	22 spindles	26 spindles	Month and year	22 spindles	22 spindles	26 spindles
1918.....	\$0.36	\$0.37	\$0.41	February 1923.....	\$0.44	\$0.49	\$0.44
1919.....	.42	.46	.48	July 1925.....	.55	.55	.55
1920.....	.68	.74	.81	1926.....	.55	.55	.55
January 1921.....	.60	.66	.73	1927 ¹.....	.55	.55	.55
June 1921.....	.45	.53	.55	1932.....	.31	.37	.36
April 1922.....	.47	.59	.55	1933.....	.31	.37	.36
September 1922.....	.41	.48	.50				

¹ Specific patterns inactive in years 1928–31.

TABLE 128.—Domestic Barmen laces of cotton: Wholesale price, per dozen linear yards, in New York for years 1924–28

[Data supplied by domestic manufacturer B]

Spindles in machine used	1924	1925	January 1926	January 1927	January 1928
16.....	\$0.33	\$0.31	\$0.26½–\$0.30	\$0.26 –\$0.27	\$0.23 –\$0.27
18.....	.45	.45	.35 – .33	.30	.30
20.....	.23	.23	.20 – .23	.14½–.20	.17 – .19
22.....	.38	.38	.34	.32	.30 – .32
26.....	.39	.39	.37½	.34 – .35	.32½–.35
22.....	.42	.40	.39½	.36	.33
22.....	.42	.40	.39	.39	.39
22.....	.42	.40	.40	.38	.38
26½.....	.45	.45	.45	.35	.35
32½.....	.55	.55	.55	.45	.45
44½.....	.80	.78	.76	.76	.72
40½ ¹.....	.80	.78	.76	.76	.72
44.....	1.25	1.25	.84	.70	.70

¹ These 4 numbers are different widths of the same net.

² The half number indicates that this lace is an insertion.

2. Imported Barmen laces

According to the evidence produced before the Tariff Commission in 1924, the wholesale prices of imported Barmen laces were fixed by domestic competition, and any decrease in prices was caused by competition of domestic manufacturers. No price lists of imported laces are published.

Data obtained by the Tariff Commission in its valuation study made in 1931–32 showed a weighted average mark-up on imported Barmen laces of 32.78 percent. By mark-up is meant the percentage added to the landed cost to obtain the wholesale selling price.

XI. COMPETITIVE ADVANTAGES AND DISADVANTAGES OF THE DOMESTIC INDUSTRY

The manufacture of Barmen laces in the United States is distinguished by the fact that it has but few disadvantages in competition with foreign-made imports.

The production of Barmen laces is well standardized. Large quantities of the same design are produced, and practically the same designs are used throughout the domestic and foreign industries.

Barmen lace machines are light and inexpensive; the most of those now in use were imported from Germany, but some were made by lace manufacturers themselves and some by a firm of domestic textile machinists.⁶ The machines are so light and small that they do not require especially constructed buildings. The initial cost of establishing in the United States a Barmen lace mill is thus much less, both absolutely and in comparison with the cost of establishing a mill abroad, than the cost of establishing Nottingham lace-curtain and Levers lace mills.

The manufacture of Barmen laces is a fairly simple process, requiring no operations which cannot readily be taught native Americans. Although one Nottingham lace-curtain or Levers machine requires the attention of a highly-skilled twisthand, who is usually foreign-born and who necessarily has had many years of training and experience, almost any man or woman can readily be taught to supervise the operations of Barmen machines. The number of machines per operative is about the same in the United States and Europe. The machines stop automatically when a thread breaks and do not require constant attention.

TABLE 129.—*Prices of Barmen lace machines, f.o.b. Barmen, Germany, 1914-23*¹

Year	Per spindle	44-spindle machine	U.S. currency value	Foreign value plus duty
1914 ¹	40 reichsmarks ²	1,760 reichsmarks ²	\$419.23	\$524.04
1923 ²	43.55 goldmarks ²	1,916 goldmarks ²	456.39	638.95
1923 ³	36 reichsmarks ²	1,584 reichsmarks ²	377.31	528.23

¹ Under the Tariff Act of 1913 Barmen lace machines were dutiable at 25 percent ad valorem under par. 165.

² Rate of exchange, \$0.2382.

³ Under the Tariff Act of 1922 Barmen lace machines were dutiable at 40 percent ad valorem under par. 372 as lace-braiding machines; this rate is maintained under the Tariff Act of 1930.

All but the very finest yarns in the manufacture of Barmen laces (and only a small proportion are made of fine yarns) are of domestic manufacture; in the cost of materials, therefore, domestic manufacturers do not appear to be at any disadvantage as compared with foreign manufacturers.

As to factory organization and speed of production, domestic factories appear to be neither at a disadvantage nor an advantage as compared with foreign factories. On both sides the Atlantic production units are large and all processes are carried out in the factory. The output of a machine is small, 5 inches being the maxi-

⁶ Only one domestic textile machine concern has produced Barmen lace machines for the trade. This firm built machines in 1917 and again in 1922 and 1923. The price of the domestic machine was \$20 per spindle, f.o.b. factory, or \$380 for a 44-spindle machine. Since 1925 this firm of machinists has abandoned the manufacture of Barmen machines.

mum width which can be produced on a machine. The total yards produced by one operative is not large, although he may tend from 20 to 30 machines. Speed of production decreases with any increases in the fineness of yarns; therefore, narrow-width, fine-yarn, Barmen laces, requiring a great number of machine motions to the inch, are rarely made in this country due to the large labor cost per unit.

No foreign firm is connected with any domestic firm which produces Barmen laces. One firm of British Barmen lace manufacturers maintains a showroom in New York, is represented on the Pacific coast, and shows fine quality Barmen laces along with a line of imported Levers laces of their manufacture.

XII. TECHNICAL PROCESSES OF MANUFACTURE⁷

1. Designing, drafting, and Jacquard card punching

Domestic firms have produced Barmen lace patterns of striking originality, some of which have been copied abroad. The usual styles have geometrically shaped objects, but patterns are now produced which include floral objects. Drafting and, to a lesser extent, designing are therefore essential steps in their manufacture. The system of continuous production of a few patterns, however, lessens greatly the expense of designing and drafting.

The draft is drawn on paper ruled in perpendicular and horizontal lines; the pattern is not so easily discernible as in the drafts of Levers laces and Nottingham lace curtains. This is partly due to the fact that the twisting of the threads is indicated by crosses and partly to the fact that the bottom of the lace, the scalop, as indicated on the draft, may appear in the upper part. The sheet prepared for the puncher is similar in appearance to the bottom bar sheet used in some Levers drafts; sometimes this sheet is dispensed with, and the pattern cards are punched directly from the draft.

The punching is comparatively simple, and the cards are perforated by the manipulation of keys which are similar to the natural keys of a piano or by a punching press similar to that used for punching cards for Levers lace machines. The Jacquard cards are about an inch and a half in width; the length depends upon the number of spindles in the machine which, in turn, governs the length of the Jacquard cylinder.

The pressure of a pattern card on pins is effected simultaneously with the working of 2 or 4 bars running parallel with the cylinder of the Jacquard and with the movement of the spindles which twists the threads around each other. This is followed by the action of two sets of beaters at the crown in the center of the machine; this series of movements may be compared with the front and back motions of the Levers and Nottingham lace-curtain machines and the action of the point bars. In the Jacquard cylinders of the Levers and Nottingham lace-curtain machine a row of holes, or a particular hole, connects with a certain row of pins or with one pin, which governs a given thread, but the principle in this case is different. The hole in the Jacquard cylinder of the Barmen lace machine is connected by the pin with a particular disk which may, in its turn,

⁷ The technical details here given of the making of Barmen laces have not heretofore been available in published form. They will furnish the reader some idea of the complexity and importance of the operations of the machines.

be connected with any of the threads used in the pattern. When the card covering a hole is not punched out, the spindle which happens to be on the disk governed by that hole remains stationary; when the card is punched out the spindle moves. The 1-thread braider is the only machine of this type in which it is possible for a spindle to stand; this is not possible in the 2-, 3-, and 4-thread machines.

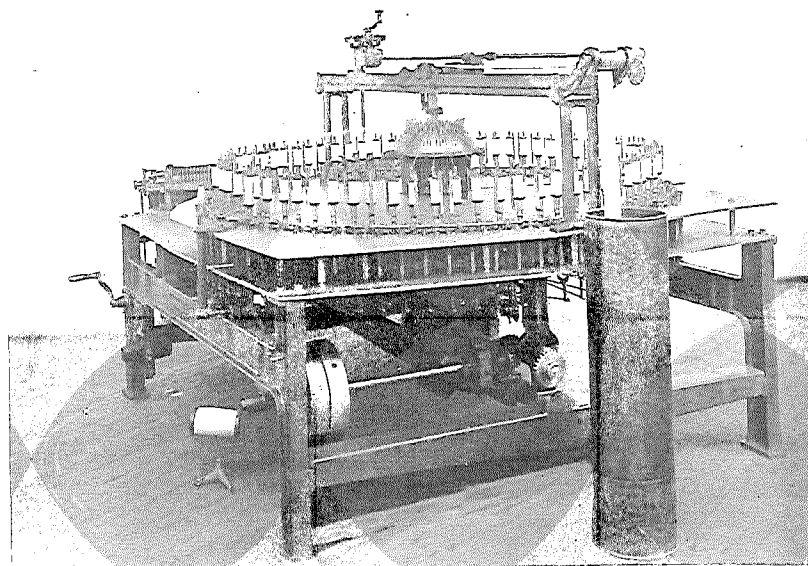
2. The machine and its operation

The single-thread, circular lace-braiding machine, usually known as the Barmen lace machine, is a special type of braiding machine with a Jacquard attachment. It is much smaller, lighter, and cheaper than the other types of lace machine which "make" their fabric by the intertwisting of two or more sets of threads moving within restricted circuits. Circular lace-braiding machines produce their fabric by the interlacing of a single set of threads, any one of which can, if desired, twist or plait with any other to form an openwork fabric.

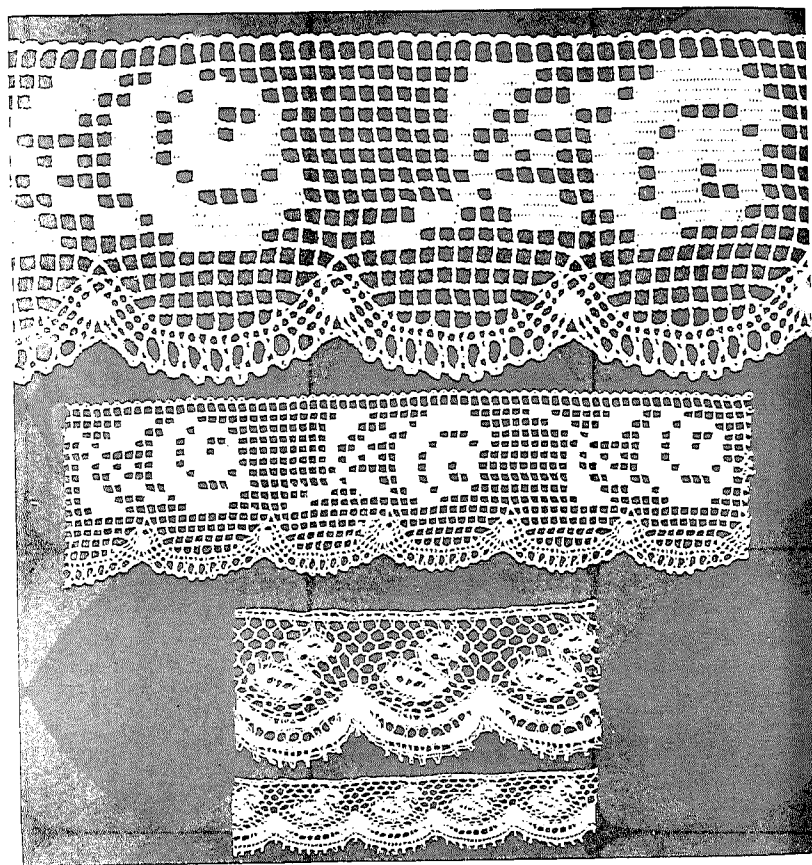
The body of the machine consists of two circular metal plates, one above the other, 4 inches apart, and the two rims, at the foot of the spindle carriers, are the same width apart as the thickness of the upper plate. This upper plate contains tracks in which the carriers are moved, such tracks forming continuous figures 8 around the entire plate; as many cogwheels as there are spindle carriers revolve continually while the machine is in motion. The top of each cogwheel is grooved, and above it is another part which fits the groove. The upper part is connected with a pillar encircled by a coiled spring, and the pillar is attached to a wire governed by the action of a pin of the jacquard. When the wire is drawn by the action of the Jacquard, the pillar is pulled down, and the notch of the carrier falls into the groove on the upper surface of the revolving cogwheel.

The yarn is carried on individual spools on upright holders; the top of each spool is notched, and into this notch a clutch falls, which prevents the spool from continuing to unwind after it has given the required amount of yarn for the work demanded by the pattern through the action of the jacquard. The clutch is lifted during the working by the tension of the thread. This tension is invariable whether the spool be full, partly full, or almost empty. The thread is entered six times, first at the stopper, second at the top of the holder, third at the center of the holder, fourth at the spring, fifth at the top of the holder, and sixth at the center of the crown of the machine, where its finished work forms part of the lace. During each twisting and plaiting the spindle threads undergo three tensions which are due to the spring, the twist, and the beat. If the thread breaks the spring falls, and as it is attached to a rim by steel wire, the rim, in falling, strikes a clutch which immediately knocks the machine out of gear and stops it abruptly; it is therefore impossible for a machine to run when a thread is missing, and the amount of damage and waste made during the process of manufacturing is reduced to a minimum. A further attachment is now added which stops the motor and therefore the machine at the slightest resistance to the operation, such as would be occasioned by the falling into the machine of a needle, pair of scissors, or other object.

The carrier and the spool of yarn above the cogwheel revolve in the tracks and may execute a circle, or pass to the next track to the right



BARMEN LACE MACHINE.



BARMEN LACES OF DIFFERENT WIDTHS MADE WITH THE SAME PATTERN CARDS.

or to the left, according as to whether the next wheel on either side presents a groove into which the foot of the carrier can pass; the carriers by moving to the inner or outer side of each other perform a plaiting or braiding movement which produces from the threads a perfect copy of some styles of bobbin and cushion hand-made laces. This statement may explain that made on page 249 that a space on the card governs a definite revolving disc and not an individual thread. The threads congregate to the center of the machine, over a circular dome called the crown, to a metal tube known as the "dorn" which is conical at the base, thicker in the middle, and is gradually pressed flat at the upper end, in the shape of a ribbon, without having sharp edges, and formed like a recumbent letter S. The circumference of the dorn regulates the width of the lace tube and theoretically they are equal to each other. The crown contains a series of grooves, equal in number to the spindles of the machine, and a dull blade, called a beater, works in each groove, the beaters moving in the grooves to the circumference of the crown and to the dorn at the center in alternate motions. They are operated by eccentrics from beneath, rise behind the twists caused by the crossing of the spindles, and press the twists on to the dorn, thus forming the pattern. All threads travel either diagonally up or down on the lace or horizontally, but the diagonal angle is so slight that the appearance of perpendicular working is obtained. Sometimes the action of the quality gearing is arrested in a manner similar to the manipulation of the "dead motions" in the Levers machine. These lost motions of the gearing affect the quality of the lace as more machine motions are packed into a given length of pattern. The quality gearing is above the body of the machine and regulates the length of lace made by a given number of motions. The length of the repeat of the pattern is determined by the number of cards required to make it and by the speed of the "take-up" which is governed by the number of cogs in the gearing wheel.

The lace leaves the machine in a tubular shape and does not become a flat breadth until the lacers are drawn. The lace tube is firmly braided and encircles the "dorn"; it is mechanically and continuously drawn upwards over and off the dorn, and is deposited in a receiver or is wound onto a large spool. The lace is somewhat stretched during its passage over the dorn; this stretching makes the pattern clearer and allows a trifle for shrinkage. The machine may make but one breadth at once, in which case the arch or scallop at the front is laced to the back. If the maximum space of the circumference of the dorn is filled by several narrow breadths, they are all laced together, and the colored lacers are flanked on each side by an empty carrier. Lacers are also used in the pattern to hold out purls, though machines are now fitted with a patent apparatus which dispenses with these lacers. It is possible by a proper regulation of the spools to make two or more breadths in different colors simultaneously. In addition, provided that the patterns require the same number of Jacquard cards, it would be possible to make two or more different patterns at the same time.

The principle of the operation has been well compared with the motion of a set of dancers around a Maypole, each holding the end of a ribbon, the other end of which is attached to the top of the pole. The dancers, as they move around the pole, threading in and out,

braid on the pole a pattern which depends upon the paths in which the dancers move. The dorn takes the place of the pole in the machine and the system of tracks with its many switch possibilities is as complicated as that of a railroad terminal. Domestic machines are built as large as 6 feet in diameter, or 19 feet in circumference, with 80 spindles. Machines are sometimes run by collective impulsion and sometimes by direct individual motors. The continuous operation of the machine for 24 hours per day and the violence of the action entail a great amount of wear and tear. The life of a machine is estimated at 10 years.

The pattern, when first placed on the machine, is inspected by the draftsman who corrects any punching mistakes in the cards. The tension of the springs is regulated in accordance with the requirements of the pattern. The working of the machine is comparatively simple, and help can be rapidly broken in. As the adjustments are made by the foreman, the tying of broken threads and the replacing of empty spools are practically the only duties required of the machine hands.

3. Finishing processes

As the yarns are bleached and mercerized before they are put into the machine, there is little to be done in the way of processing after the lace is made. Any faulty material is cut out and the ends deftly joined in such a way as to leave no traces. The lacers are always of colored thread; this is a precaution and reduces the chance of a mistake in drawing to a minimum. After the lacers are drawn, the material is calendered and wound on cards in required lengths ready for sale.

4. The same pattern made in different yarn counts and qualities

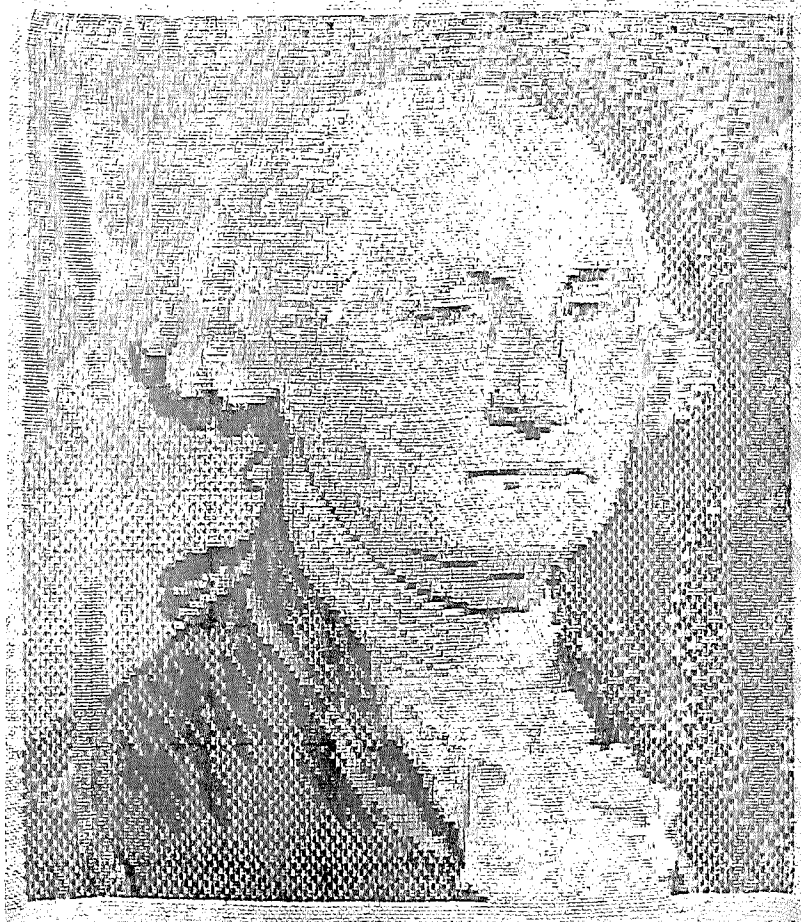
A successful pattern, made of yarn of a certain count, is frequently made also of yarns of other counts. This can be done from the same pack of pattern cards. It is obvious that a lace made of finer yarns should be narrower in width and proportionately shorter in pattern than if made of coarser yarns and vice versa, otherwise the fine yarn pattern would be too attenuated and the coarser yarn pattern too consolidated. In the first case the coarse lace is imagined as seen through a diminishing glass, and in the second the fine pattern is imagined as seen under a microscope. It is essential to a proper balance of such patterns that each should have a relationship of definite proportion to the other in width and length of design. This requires a thicker or thinner dorn for the width and a different rate of "take-up" for the quality. Roughly speaking, it may be said that the diameter and circumference of the two dorns must bear the same relationship to each other as the reciprocals of the square roots of the yarn numbers. The mathematical formulas for determining these requirements are fully worked in an article by Prof. Bernard Lepperhoff, published in Melland's "Textilberichte" for January 1924.

CHAPTER V

LYONS ALENÇON LACE

INTRODUCTION

PLATE 14



PRODUCT OF THE BOBBINET-JACQUARD MACHINE.

Lyons Alençon lace is the name applied in recent years to some of the finished products of the bobbinet-jacquard machine and as such must be distinguished from other laces bearing the name "Alençon." Hand-made Point d'Alençon lace itself is a French variation of Venetian point lace, its name being derived from the town in France where the variation was first made. Both hand-made Point d'Alençon and bobbinet-jacquard Lyons Alençon must be distinguished from Alençon lace which is a Levers machine-made imitation of the bobbinet-jacquard product rather than of the hand-made product.

Lyons Alençon laces are made as edgings, insertings, galloons, and flouncings, ranging in width from 1 to 36 inches; they are also made into shapes and motifs cut from the breadths. In addition, they are made as scarfs, shawls, capes, and other articles of feminine attire, and as doilies, table runners, place mats, bedspreads, and other articles used for upholstery.

Lyons Alençon laces are of two kinds, plain and embroidered, the latter kind being finished by outlining the objects of the design with cordonnets or brodeurs. This process is done partly by hand and partly by different types of embroidery machines. The embroidery is sometimes very elaborate and increases considerably the price of the article. The following are some of the names given to the various styles: Point d'Alençon, Chantilly, Point de Flandre, Point Grenada (Spanish), Malines, Margot, and Point Medici.

Lyons Alençon laces are sold wholesale by high-class lace importing houses. The principal French producer has branches in New York and Chicago; the Syrian dealers handling Chinese hand-made laces also import Lyons Alençon laces. These laces are also imported and sold retail by department stores and specialty shops.

The bobbinet-Jacquard or "bobine-circulaire" machine is in fact a bobbinet machine, with Jacquard attachment, invented about the year 1839.¹ There are no such machines in the United States; their use is confined to continental Europe and largely to the Lyons District of France where about 150 are installed. Some of the machines in France are operated in Levers or bobbinet lace mills.

Although cotton, silk, rayon, and metal threads are used as raw materials, Lyons Alençon laces are made chiefly of cotton. Metal-thread laces are of two kinds, those in which heavy metal threads are used to outline the objects of a cotton ground and those in which the bobbin threads are also of fine metal, the warp being of cotton. When the metal threads are of silver, the cotton warp is white, and when the metal threads are of gold, the cotton warp is black.

¹ Authorities differ as to the inventor, one writer asserting that this is the machine made practical by Ferguson's application of the jacquard in 1837 and another authority holding that the invention was by M. M. Michael Dognin and Augustine Isaac. The machines were formerly operated in England under the name of the "pusher" machine.

The bobbinet-jacquard machine has two comb bars, as in plain bobbinet machines, but the back combs are longer than the front ones to allow the division of the carriages into three rows, which through the governance of an overhead jacquard à ficelle move across the breadth of lace diagonally and return; this traversing of the bobbins across stationary warp threads produces the pattern. The machines are from $3\frac{1}{2}$ to $6\frac{1}{2}$ yards wide and the gages range from 6 to 16 points. The gage is reckoned in the same manner as that of the Levers machine, there being two carriages to a point and 12 to 32 carriages to the inch. The most usual gages are 9 to 12 points. The method of working the jacquard is uncommon, as sometimes the same card will be presented twice in succession and sometimes the cylinder will be reversed, and a card which has already been used will be presented again to the grid. The drafting of the patterns is done on squared paper and the patterns are painted in the same fashion as those for Nottingham lace curtains.

The machines are operated by both men and women. Before the war men alone were employed, but the shortage of male labor during the war led to the employment of women who, proving capable, have been retained. However, the employment of women has entailed the engagement of more foremen, as women workers are not capable of adjusting machines in the event of a breakdown.

There are no available data regarding foreign production of Lyons Alençon lace, and there is no production in the United States. The wages paid for making these laces are to be found in the Lyons wage list mentioned in the appendix, page 342.

IMPORTS

Under the Tariff Act of 1922 imports of Lyons Alençon laces were included with other types of laces under the heading "Machine-made laces." Under the Tariff Act of 1930 the imports of the products of the Levers lace machine, imports of Nottingham lace-curtain machine products, and imports of nets and nettings were separately recorded, there being a classification for "Other" machine-made laces, in which Lyons Alençon laces are included. Imports of "Other" machine-made laces of cotton, silk, rayon, and metal threads are shown in the following table. Of these total imports, 68 percent in 1931, the year of greatest value, came from France. By the deduction made in the note following the table it is clear that France's share of these total imports are made up almost exclusively of Lyons Alençon laces.

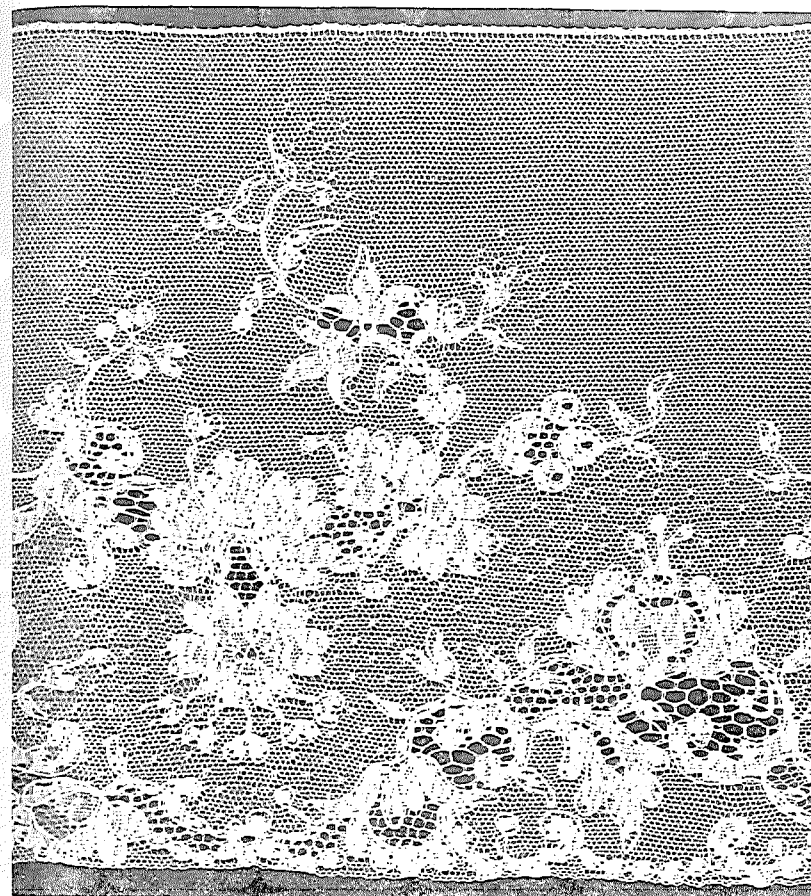
TABLE 130.—Other machine-made lace: Imports for consumption under Tariff Act of 1930

Year	Cotton	Silk	Rayon	Metal threads	Total
1930 (June 18-Dec. 31).....	\$505,823	\$216,143	\$11,002	\$25,857	\$758,825
1931.....	1,065,951	300,735	23,282	41,443	1,431,391
1932.....	531,225	97,821	15,182	20,132	664,360
1933 ¹	66,914	64,300	11,118	13,893	156,225

¹ In 1933, the value of imports of Lyons Alençon laces of cotton was separately recorded as \$107,895, making a total for "Other machine-made lace" of \$264,120.

NOTE.—Eight basic types of machines produce laces. The products of the Levers lace machine, of the Nottingham lace-curtain machine, and of the various net machines are removed from the category of "Other machine-made lace" by reason of specific recordings. The remaining types are Lyons Alençon, Barmen, Schiffli, Bonnaz, and knitting machine laces; as most of the imports of Barmen and Schiffli laces are from Germany, as products of the Bonnaz machine come chiefly from Switzerland, and as the imports of knitted laces are negligible, by elimination, the French share of the import figures listed above (68 percent

PLATE 15



LYONS ALENÇON LACE.

THE MARK-UP ON LYONS ALENÇON LACES

The mark-up, the percentage added to the landed cost to obtain the wholesale selling price, was deduced from data obtained by the Tariff Commission, in its valuation study conducted in 1931-32, from five importers of Lyons Alençon laces. These percentages were 40.6, 47, 59.5, 79.6, and 105.7, respectively, with a weighted average of 56.2 percent for the group.

CHAPTER VI

MODERN HAND-MADE LACES

I. THE HAND-MADE LACE INDUSTRY IN EUROPE SINCE THE WAR

The World War and its social and economic consequences dealt harsh blows to the already declining hand-made lace industry in Europe. These blows, together with the effects of competition from China, into which country hand lacemaking was introduced during the war, have reduced the European industry to the lowest production point in its history, although it continues within circumscribed limits because of its undeniably greater perfection.

Practically all of Belgium and a large part of the lacemaking district of France were actually in the war zone. In addition to the devastation and scattering of peoples in those zones, industry was dislocated in all European countries and there were compulsory transfers of workers to war industries. The demand for lace and the making of lace practically ceased, and the large body of those people in all European countries who were formerly content with their lacemaking crafts, were drafted into big industry. At the close of the war the scarcity of labor and the high wages in other industries, together with the restless and reckless spirit engendered by the war, definitely accomplished the divorce of about 50 percent of fine artisans from lacemaking and other similar crafts. Post-war child labor laws, improvements in the manufacture of machine-made lace, the trend of fashion and decorative arts away from laces, and the competition of China in supplying the reduced demand for hand-made laces are factors which complete the picture of the difficulties of hand lacemaking. Even though the demand revived to some degree after the war as compared with the war period, the scarcity of workers kept prices at high levels, thus restricting purchases. It was estimated in France that in 1924 the number of workers engaged in hand lacemaking was 50 percent less than the number engaged in the craft in 1914, and it is known that this percentage has been increased since 1924. In Belgium the number of people engaged in making lace in 1930 was 42 percent smaller than in 1914. Italy has lost out completely in the manufacture of fine laces since the war and now produces largely lace articles. Most of the lacemaking schools in Belgium and France have closed since the war owing to lack of interest shown in the craft and the unwillingness of young people to devote their lives to such meticulous, confining, and poorly paid work. Convents practically have ceased instruction in hand lacemaking.

1. France

The largest hand-made lace-producing district in France is centered at Le Puy in the Department of the Haute-Loire and extends into other parts of the Loire—the Puy de Dôme and Lozère. The laces made in this district are not the finer laces, but chiefly linen laces used

largely for furniture covers, bed covers, curtains, table covers, table napkins, table centers, doilies, church ornaments, altar fronts, and surplices; there is also a smaller production of laces for lingerie, dresses, corsets, and handkerchiefs.

In 1923 the number of workers in this district was estimated at 75,000 during winter months and 50,000 during summer months, but since that date the numbers have decreased materially. The workers consist chiefly of wives and daughters of farmers; they may work for a lace "manufacturer" who supplies the materials and the designs or they may make designs in general use and sell their laces to the manufacturer. There are about 300 such manufacturers in the district. Lacemaking has practically ceased in the convents of the region. The yarn used for laces in this district is linen from 16 to 30 lea for furniture laces and 84 to 120 lea for fine lingerie laces. These yarns are obtained from Lille or from Belgium. Cotton is not used and silk and metal thread only on demand.

Hand lacemakers in the Haute-Loire district are paid by the meter or by the motif of the design; payment usually works out on a time basis to 75 centimes to 1 franc per hour for ordinary work and 1.50 francs for finer work. The work is done by women and girls in their homes. The art of lacemaking usually is transmitted from mother to daughter, but there is a special school in Le Puy which gives instruction in the higher branches of the art. Free board and lodging are furnished 30 pupils annually, and girls resident in Le Puy may attend as day students.

The best market for laces produced in this district is the French market itself, followed by England, Argentina, Uruguay, and Australia. Exports to the United States are small. The principal foreign competition is from Madagascar, Indo-China, and China, but more serious than this competition is that of machine-made Barmen laces produced in the same district which is the principal center for the manufacture of such laces and utilizes some 2,000 machines operated by upwards of 100 manufacturers. The price of a lace made by hand is usually about five-fold the price of the same pattern made by the Barmen lace machine.

The second largest lacemaking district consists of the Departments of Orne and Calvados, which include the towns of Alençon, Argentan, and Bayeux. This district specializes in the making of fine laces in nearly all styles, but is most famous for Point d'Alençon and Chantilly. It is estimated that 85 percent of the lace produced in this district is made in homes or in schools. Point d'Alençon is made exclusively in homes and is usually made to order from designs supplied by the manufacturer. The average wage for workers in 1928 was 2 francs per hour. The thread used—cotton, linen, and silk—is obtained from Lille or from England. Chantilly is made exclusively in Bayeux.

In all three of the towns above mentioned there are schools, subsidized by the Chamber of Commerce of the region and receiving Government aid, which teach the art of lacemaking to children. M. A. Lefébure, one of the foremost art connoisseurs and lace merchants in France, conducts a school at Bayeux for instruction in hand lacemaking. He ascribes the decline in hand lacemaking partly to the French school law, which prevents children from working before attaining the age of 14 years, and to the fact that since the war mothers no longer teach the art to their children. The subsidized school at

Bayeux is successful only in a measure, as only a small percentage of the students complete their courses and continue in the craft.

Fine hand-made laces are also made in the vicinity of Lille: Valenciennes and Bailleul. Production in this district has declined drastically since the war. Practically all of the laces made in this district are made of linen thread, the counts varying from 60/3 to 250/3, with 100/3 most in demand. The average daily wage is from 10 to 12 francs.

2. Belgium

Belgium is the principal European producing country of hand-made laces at the present time, although her production is much less than the pre-war production.

There were approximately 60,000 persons engaged in hand lace-making in Belgium in 1914, and in 1927 only about 35,000. Belgium probably had greater difficulties in obtaining workers immediately after the war than any other country. Higher wages in large factories drew the women and girls away from lacemaking and a large percentage of them seem to have lost their desire to continue in the craft. An association of lace merchants, created at the close of the war, succeeded in collecting about 8,000 workers by offering 60 percent of the wages earned in factories, guaranteeing full-time work.

Lacemaking in Belgium is a very individualistic business. There is no close association of manufacturers, nor any tendency to group workers into large units. The "manufacturer" is really a merchant or commercial contractor who receives orders at home and abroad and distributes his orders among middlemen. There are between 200 and 300 of these merchants in Belgium; frequently they are designers as well as business men. The middleman receives orders from the merchants and distributes the work to the women and girls in their homes, or he accepts work done independently in the homes for sale to the manufacturer; further, he may be a representative of a convent in which lace is made. Most Belgian lace is made by women who, working in their homes, fill specific orders. However, a large quantity of lace is made in convents; the number of lace workers in convents, nuns and pupils combined, is estimated to be 15,000. The quality of convent-made lace is generally considered superior inasmuch as the supervision is much more rigorous. The third class of lacemakers comprises women working independently in their homes and who take their laces to the nearest town on Saturday and sell it to the middlemen. Children are taught to make lace both in the convents and in the home. In all cases lacemaking in Belgium may be considered as a by-industry of agriculture, education, and housekeeping. The women and children who make lace in their homes in the winter work in the fields in the summer and devote only their spare time to lacemaking. Lace is made by the children in the convents along with regular studies. According to Belgian law, children may start working one hour per day at the age of 12, and at the age of 14 they may work for a full day of 8 hours.

Exceedingly fine cotton yarns have largely replaced linen in Belgium for the making of lace by hand. Some of these cotton yarns are spun in Belgium, but the finest are imported from Nottingham. A very wide range of yarn counts is used, extending from no. 8 to no. 500/2;²

² No. 500/2 cotton yarn measures 210,000 yards per pound and is made of single yarn measuring 420,000 yards per pound.

this latter is entirely beyond the range of any cotton yarn used in making the finest Levers laces. Linen yarns employed in Belgium are spun in that country; counts up to 300 lea³ are used. Silk yarns are used to a small extent and are imported chiefly from France.

Inasmuch as wages are paid by the piece the earnings of the workers depend upon their skill and application to their tasks. As lacemaking is a spare-time occupation the workers are willing to accept a lower wage than they would demand if they were in factories for a definite number of hours each day. An investigation by the Belgian Government in 1928 disclosed the following facts concerning wages:

About 50 percent of workers earn 60 centimes (1.668 cents) to one franc (2.78 cents) per hour; 30 percent earn 1.10 francs (3.058 cents) to 1.50 francs (4.17 cents); 20 percent earn 1.60 francs (4.448 cents) to 2.15 francs (5.977 cents).

In Bruges and vicinity they work from 12 to 14 hours per day and earn 80 centimes to 1 franc (2.224 cents to 2.78 cents) per hour as an average. In Ypres they earn 6 to 7 francs (16.68 to 19.46 cents) per 10-hour working day.⁴

The following is a classified list of laces made in Belgium:⁵

Bobbin and pillow laces.—This category comprises:

- (1) Thread laces.
 - "Tirettes."
 - Cluny.
 - Guipure.
 - Belgian torchon.
 - Thick torchon of Duchesse style, specially used to serve as ornamentation at the foot of shades and curtains, and for furniture lace.
- (2) "Duchesse", including Bruges and Rosaline, a variety which the Italians designate as "Point de Michel-Angelo."
- (3) "Point de Paris" of four kinds.
- (4) "Flemish point" of two kinds.
- (5) "Point Binche" of five kinds.
- (6) "Valenciennes" of eight kinds.
- (7) "Point Lille" of five kinds.
- (8) "Chantilly."
- (9) "Malines" of four kinds.

Needlepoint laces.—This category comprises:

- (1) "Venetian point" of four kinds.
- (2) "Ivory point."
- (3) "Rose point."
- (4) "Points de France", comprising Point d'Argentan, Point d'Alençon, Point de Sedan.
- (5) Fine "Point de Burano."
- (6) "Flemish point gaze" with classic flowers and superimposed petals.

Mixed-point laces, executed in part by the bobbin, the needle, the crochet hook, or in any other manner. This category comprises:

- (1) Brussels Duchesse ornamented with medallions and flowers in point gaze.
- (2) Brussels lace with point gaze ground.
- (3) Needlepoint mixed with Flemish point gaze, point Burano, and Venetian point.
- (4) Brussels appliqué.
- (5) Real point Milan, also sometimes called, Old Flemish Point Milan; Point Milan partly hand-made.
- (6) Embroidery on net executed by the chain stitch (Point Lierre).
- (7) Embroidered laces.
- (8) Semihand-made lace called "Princess" of machine-made braids⁶ and objects appliqued or basted on machine-made net.
- (9) Laces of machine-made braids,⁶ sewn together with the needle, by connecting brides, known as point d'Alost, Luxeuil, and Renaissance or Battenburg.

³ Ninety thousand yards to the pound.

⁴ Le Neptune, Anvers, November 20, 1928.

⁵ A handbook was issued by the Ministère de l'Industrie, du Travail, et de la Prévoyance Sociale.

⁶ These braids are made at Calais, France, and are known as "Lacet" and "Mignardise."

In addition Belgian workers make some crochet laces and some imitations of Teneriff and Paraguay laces.

Belgian laces are made both in breadths and in indefinite lengths, and also in an infinite variety of practical, decorative, and novelty articles and objects.

The value of the annual production of hand-made lace in Belgium before the war was estimated at 10 million to 15 million francs (\$1,930,000 to \$2,895,000).

A large and indefinite Belgian production of lace never enters into Belgian export statistics and enters inadequately into the import statistics for foreign countries; this is due to the fact that the large numbers of American and other tourists who visit Belgium buy substantial quantities of Belgian laces which escape declaration as exports. Lace dealers cater to the tourist trade. In Brussels there are 60 shops retailing lace exclusively.

A number of American department stores maintain purchasing agencies in Brussels.

The Belgian law relative to the sale of hand-made lace.—The Belgian Government has taken action to protect its hand-made lace industry against the practices of certain firms who do not hesitate to sell machine-made lace as hand-made. Geographical names—Valenciennes, Chantilly, Bruges, Point de Paris, Binche, Malines, and others—are applied to machine-made as well as to hand-made lace, and the absence of all regulations created a serious situation which compromised, to a certain extent, the reputation of Belgian hand-made laces. For a number of years the makers of hand-made lace have urged, through their trade association, the necessity of a law which would guarantee the authenticity of hand-made lace against competition from machine-made imitations. A number of reports, among others one entitled "De l'action Pénale en Matière de Dentelles," 1910, demonstrates the sincerity of their effort to gain protection.

A recent consular report contains the following explanation of the law:

According to government regulations now in force in Belgium, hand-made and machine-made lace may not be sold in the same store and the only kind of lace that can be sold, exposed for sale, or stored in a lace store, as true "Application de Bruxelles," is the semihand-made lace composed of flowers or of motifs made by hand, either by spindles or by needle, and applied by hand on tulle made by machine. It must be noted that no material is permitted to pass as true "Application de Bruxelles" which is made with designs turned out by a machine and joined together by hand.

The official text of this law is shown:

MINISTRY OF COMMERCE, OF LABOR, AND OF SOCIAL ECONOMICS

Albert, King of the Belgians, to all, present and to come, greetings:

The Chambers have adopted and we are sanctioning what follows:

ART. 1.—There may only be sold, offered for sale, or kept in the stores as real laces, laces made by hand, the laces made entirely by hand, that is to say, those of which all the points or "figures of thread" have been exclusively formed by the hand of the worker with the sole help of spindles, the needle, crochet hook or other utensils used in the making of hand-made laces.

ART. 2.—There may only be sold, offered for sale, or kept in the stores as real "Application de Bruxelles," the laces partly hand-made, composed of flowers or of motifs made by hand, by spindles, or by the needle and which are applied by hand on machine-made net.

ART. 3.—An extract from the present law, reproducing the text of articles 1 and 2 and prefaced by the words "Extract from the law protecting the authenticity of hand-made laces," must be displayed, in a suitable position, in all stores where laces are offered for sale.

The dimensions of the notice shall be 20 c by 30 c.

The invoices shall carry a declaration of the authenticity of hand-made laces.

The same invoice may not make mention of real laces and of machine-made laces.

The merchant who infringes this order shall be liable to a fine which may not exceed 50 francs.

ART. 4.—All infringement of articles 1 and 2 of the present law shall be punished by a fine of 500 to 1,000 francs.

In case of a repetition, the fine shall be doubled.

In this case, the sentence may, in addition, order the closing of the store of the offender during a period of a month, at the most.

We promulgate the present law, we order that it be stamped with the state seal and be published in the *Moniteur*.

Given at Brussels, 30th March 1926. ⁷

The publication from which the law is quoted gives, among other items, the following readings not specifically contained in the wording of the law.

The first article of the law does not forbid the application of the geographical names—Valenciennes, Malines, etc.—to machine-made laces, but as it is the custom to display all hand-made laces, or partly hand-made laces, with a ticket stating that fact, it is understood that Valenciennes, Malines laces, etc., not so ticketed are machine-made.

The second article excludes "point d'Alost," "Luxueil," "Renaissance," and "Princess lace," which are partly hand-made laces, because the motifs, as well as the net, are entirely machine-made; the only handwork in these laces consists of the insignificant portion of needle work necessary to bind the objects together. These laces, therefore, must carry the inscription "mi-manuelle." Further, the word "mixed," which at first sight seems to be synonymous with semi-hand-made, may not be applied because the term is used exclusively for certain entirely hand-made laces in which, as in "points de Paris mixtes," two different grounds, but entirely made by hand, with spindles, appear in the same pattern.

The third article applies to wholesale lace houses; to stores and specialty shops; also to peddlers who sell lace by the yard or as finished articles in hotels and elsewhere.

The fourth article makes the furnishing of a signed certificate of the authenticity of hand-made laces compulsory on demand of the purchaser, and requires separate invoices for hand-made, mi-manuelle, and machine-made laces.

3. Italy

Although hand lace-making attained its greatest development in Italy, the decline of the Venetian Republic witnessed also the decline of Italy's prestige as a lace-making country. Large quantities of lace continued to be made in Italy, but the more extensive development of the craft in Belgium and France overshadowed the hand-made lace craft in Italy. Gradually Italy turned more and more to the manufacture of lace articles rather than the manufacture of lace; this trend has been greatly accentuated since the war. Part of the lace of which these articles are formed is made in Italy and part is imported,

⁷ The Belgian hand-made lace merchants consider that their position under this law is somewhat analogous to that of the jewelers who have obtained similar protection upon the subject of Japanese pearls, whereby the vendor is bound to inform the purchaser of the origin of the pearls sold.

principally from China, the motifs being produced in Italy and the filet edgings in China. The Italians became alarmed at the growth of imports of Chinese lace from \$16,764 in 1921 to \$79,166 in 1926, but such imports dropped drastically in 1927 and have since declined practically to the vanishing point.

The United States is an important factor in the Italian lace industry. Not only is the United States a chief foreign market for Italian lace products, but American capital has largely developed the Florentine lace embroidery industry. Lace-making is carried on largely in the northern part of Italy, principally in the region south of Lake Como and in the islands of Bellestrina and Burano near Venice. Some fine laces are made in Florence and Rome.

The lace "school" is a distinguishing characteristic of hand lace-making in Italy—a "school" being a number of women and girls working for a forewoman in her house or in their own homes.⁸ The forewoman distributes the materials and pays the workers by the piece, or less frequently, by the day. The forewoman works on orders supplied by the producer. The producer's headquarters is merely a point for assembling raw materials and for packing and shipping the completed product.

Wages paid to lace-makers are exceedingly low. A consular report in 1925 furnishes information regarding wages paid to workers in northern Italy at that time.

A girl beginner, who is given simple work, is satisfied if she makes from 1.50 to 3 lire per day (\$0.06 to \$0.12). The remuneration of experienced workers averages about 5 lire (\$0.204) per day, while those who produce the finest and most artistic work may earn from 10 to 15 lire (\$0.408 to \$0.61) or even 20 lire (\$0.82) per day. It should be said, however, that as the industry has become more commercialized the demand for the most skilled workers has decreased, owing to the diminishing market for those extra fine articles the production of which involves a large amount of skillful, painstaking labor.

The above figures indicate only the average labor cost. Most workers are paid by piecework, and the payment naturally varies according to the type of design or the quality of the work. In those few instances where the workers are paid by the day, the wage amounts to 5 to 7 lire (\$0.204 to \$0.29).

Wages in Rome are much higher than those paid in the districts of northern Italy. It was reported in 1928 that the average daily pay of a lace worker in Rome was 16 lire (\$0.84) per day of 8 or 9 hours; beginners were paid 5 to 10 lire a day (\$0.26 to \$0.53), and expert workers making classical and artistic laces received from 25 to 30 lire (\$1.32 to \$1.58) per day. Wages of lace workers in the Rome district, but outside of Rome, are generally 10 to 15 percent lower than in Rome.

Linen, cotton, and silk yarn used in the Italian lace industry are of Belgian, Irish, Italian, or French production and are supplied in practically equal quantities from those four sources. Most Italian laces, however, are made of linen yarn.

The Italian merchants conduct their trade in lace articles on no fixed price basis. Large profits varying from 100 to 400 percent are made on lace articles and the purchase price is usually fixed by bar-

⁸ The Scuola Regina Elena at Burano, for the study of the making of Point Burano is under the patronage of the Queen of Italy.

gaining. A thorough knowledge of the Italian lace business and Italian business methods is essential to the success of a wholesale buyer. Somewhat less variation exists with regard to the prices of laces and motifs, the former being sold by the meter at a given price per "hole", the latter at a given price per thousand holes. However, even in these cases prices are finally determined by bargaining. There is little that is modern in the Italian method of distributing laces and lace articles. Most producers make little effort to intensify the distribution of their goods; they wait for buyers to come in. In a few instances, however, where American capital and American enterprise is involved, more intensive trade promotion and trade methods are adopted, and sometimes the merchants consign their products to branch houses in the United States for distribution.

Italian lace articles are in large part sold in the tourist centers of Florence, Venice, Rome, Genoa, Naples, Palermo, and Perugia. The principal foreign markets are the United States, England, Canada, Mexico, Australia, and certain of the South American Republics.

Italian exporters estimate that at least 40 percent of their shipments of lace and embroideries are in units of less than \$100 in value and thus are not recorded in Italian export statistics. Inasmuch as those laces are sent into the United States by parcel post, or are carried by returning tourists, a substantial part of domestic imports of Italian laces never appear in official statistics of the United States.

The Maltese law relative to hand-made lace.—The Senate and Legislative Assembly of Malta passed an act, which became operative on July 1, 1927, for the protection of the local lace industry. This act provided that within 1 month from its promulgation every merchant should notify the Maltese Minister of Industry and Commerce of the quantity and value of foreign lace in his possession which was manufactured in imitation of the lace commonly made in the Island of Malta and its dependencies, and also furnish, in writing, a report of the quantity and value on order with any foreign firm. The minister was given power to acquire such foreign lace at its invoice value, plus a compensation of 10 percent on such value, the value to be established by the production of documentary evidence. Further importation of machine-made lace in imitation of that manufactured by hand in Malta and the islands of Gozo and Comino was absolutely prohibited. Any violation of this regulation is punishable by a fine of £1 to £50, and for a second offense the fine may be doubled and the goods forfeited.

II. THE HAND-MADE LACE INDUSTRY IN CHINA

1. Origin and extent of the industry

Since the war China has become the principal commercial producer of hand-made laces and at times has offered strong competition to European producers. During the years 1921 to 1927 American imports of Chinese hand-made laces were large in quantity and large in proportion to total value of imports of hand-made laces. Beginning in 1928, however, such imports have declined steadily and drastically.

The hand-making of silk torchon and Cluny lace in China was originally introduced into Chefoo, in the Province of Shantung, by Scottish Presbyterian missionaries. In 1895 the industry was placed on a small commercial basis by the establishment of the Chefoo

Industrial Mission for the sale of its products. As early as 1910 the Chinese, employing Belgian and French methods and designs, entered into competition with Europe in the production of Cluny and torchon laces; however, it was not until 1916, when filet lace was introduced, that Chinese production and exports began to assume important proportions and to become an item of importance in Chinese export trade with the United States. In 1919 the manufacture of a small amount of Venetian and Valenciennes laces was begun in the Province of Shanghai, and in 1920 the production of crochet lace was commenced at Swatow.

The first place to become an industrial center for the manufacture of lace was Chefoo, also the center of production of hair nets. Pootung, the industrial section of Shanghai, and Wusih, a city 70 miles north of Shanghai, are centers for the production of filet lace; a small amount is also made at Swatow, which is the center for the production of crochet lace. The net forming the basis for filet lace is made in the Ningpo district of Chekiang Province. Districts specialize in styles of lace and find difficulty in altering styles quickly, a disadvantage which might be obviated if the articles were made in a factory under the immediate supervision of business men who are in close touch with the markets in the United States.

2. Production methods

The styles of lace made by hand in China, in the order of their importance, are filet, crochet, Cluny, torchon, Venetian, and Valenciennes; these laces are produced chiefly as edgings and insertions of the same widths. The Chinese, as a rule, copy and do not originate designs or styles.

Chinese filet lace, so-called, is made by embroidering the pattern upon a hand-knotted net stretched over a wire frame. The finest qualities are made in the Wusih district, where a mission industrial school is maintained for training of workers. The net or mesh which forms the framework of the pattern is made by hand; coarse nets have 10 holes to the inch, and fine nets have 13 holes to the inch.

The net is gathered by agents who distribute it in the lacemaking districts of Pootung and Wusih. Finer filet nets are embroidered by passing the needle through the net and returning it from beneath. This process is very trying and imposes such eyestrain that many workers outside these two towns refuse to make them. The narrow 6- and 9-hole picots are made in the Wusih district. The wider filets, from 30 to 50 holes, are made chiefly in the Pootung district, and patterns are made by the needle in what is called the "running stitch". Filets made in this manner, however, are not so good as those made by the method previously described. The rose-and-leaf design, the most popular pattern made by the Chinese, is the best seller today. Among the important varieties of filet lace made are embroidered filet and filet antique.

Crochet lace⁹ is produced by making the designs with a steel needle in the manner of ordinary crochet work. Four patterns only of

⁹ The Irish Free State recently brought an action in the United States courts with the object of preventing the use of the word "Irish" as applied to importations of crochet lace from China, and the practice is now discontinued. It has for centuries been the custom to identify a style of lace with a geographical term, indicating the locality of its prime origin.

crochet lace are made—the rose, the rose and shamrock, the rose and wheel, and the rose, shamrock, and wheel combined. In addition to the distinctive figures—rose, shamrock, and wheel—all these patterns contain one or more small half-moon shaped objects, known as beans. The widths are quoted for price purposes as containing 1, 2, 3, or 4 beans; exceptionally, an edge and an insertion of 5 beans are made. The work is made in three qualities; the best is known as Swatow, the medium as Siccawei, and the common as Shanghai.

Cluny and torchon laces are made by the methods described for making pillow and bobbin laces by hand. The design is fastened upon the pillow, the bobbins are twisted or plaited in accordance with the design, and the twists, so formed, are fastened by pins. A simplification of the manufacture of these laces has been introduced, consisting of the use of a 3-inch revolving cylinder above a flat surface upon which the bobbins rest. The pattern is attached to the cylinder, and by its revolution forms a continuous design. A similar apparatus, used for making lace in Puerto Rico, is fully described later. The number of Cluny designs made is not large, possibly not exceeding 10 to 12, but large numbers of torchon patterns are made.

The making of Venetian lace was introduced into China by Syrians. The patterns are produced by embroidering over and through paper designs. In addition, small motifs of this style are made and are introduced into cut-out spaces in lace articles which are often edged with narrow filet. The output of Venetian lace is limited and is mainly from convents in the Shanghai district.

There is a small output of Valenciennes and Binche laces made in narrow widths. In addition to the styles of laces already described, numerous articles are made and are freely sold—tatting laces, galloons, doilies, motifs, medallions, and butterflies. Butterflies are made with a wing-spread as large as 8 inches; these articles are mainly of the Maltese, torchon, and Cluny style, and there is evidence of the gradual introduction of a variety of features which may presage the advent of an original and oriental style.

3. Trade organization and system of merchandising

Lacemaking in China is entirely a home industry, and the workers are usually engaged in other forms of activity. This is particularly true of the Pootung and Swatow districts where during the harvesting seasons from June to October production drops to a very low ebb. The installation of a factory system would make the cost of the lace prohibitive, as in accordance with Chinese custom the workers would have to be fed, and the present plan obviates overhead expenses. Head workers receive specific orders for laces and obtain thread from Swatow and distribute the materials and designs among the workers in their homes; these native brokers usually control about 200 workers each. They pay the workers on the basis of the mesh yard, collect the finished work, and retain the difference between their sale price to the merchants and the wages paid the workers plus the cost of the thread. In the Shanghai district the workers receive approximately 8 to 15 cents silver per day, the average worker receiving 10 cents silver per day. Workers in net at Pootung and Wusih are paid from 28 to 42 cents for making the net produced by 200 yards of thread.

After the laces are delivered they are inspected in the establishment of the purchaser for torn borders, rust, soiled work, and broken holes. It is difficult to instill into the minds of Chinese workers the importance of cleanliness. At times the soiled condition of the work results in a third of the product being classed as "seconds." Rigid European or American supervision is needed to reduce this percentage. Where the work is collected from Chinese homes by native brokers, it is found to be impossible to inculcate the necessity for cleanliness. The laces are graded into three classes, the inferior products being disposed of in job lots to Chinese peddlers. After inspection the laces are measured, carded, and ticketed preparatory to shipment, the bolts containing from 12 to 100 yards each. Shipment is made in cardboard boxes holding 50 pounds of lace, usually 50 bolts. The boxes are wrapped in waxed paper covered with a muslin lining, sewed and stenciled and are ready for shipment. English is the commercial language of most of the trading ports. About three-fourths of the exports are cleared through Shanghai; Chefoo holds second place, and is followed by Ningpo, Swatow, and Nanking.

The exporters make their purchases from native brokers or scouts on various bases. Filet laces are purchased on the basis of the number of meshes in the breadth; torchon and Cluny, according to the number of bobbins required; and Venetian laces, by the inch breadth.

4. Thread

British thread of J. & P. Coats has held a dominant position in the Chinese lace industry from the commencement. Japanese thread obtained a foothold during the World War when deliveries of British thread were uncertain, but with the restoration of normal conditions the superiority of the British article insured its return to favor. Japanese thread is reported to be defective in wearing quality, as the strands separate when the lace is washed. A small amount of Chinese thread is now produced of a quality reported to be superior to that imported from Japan. Limited quantities of high-grade Belgian and French threads are imported for use in making the best-quality laces.

Laces made in China are made of 6-cord threads, ranging in counts from 20 to 80, and wound on spools containing from 500 to 2,400 yards. Numbers 30, 40, and 50 are used in the making of filet laces. Number 50 is used for heavy crochets and numbers 70 and 80 for the finer crochets. Three-cord threads are used for the finer patterns and are imported in 10-pound bundles. Three-cord linen thread, numbers 60, 70, and 80, is used in the very finest and highest grades of crochet laces. Valenciennes laces are now made of mercerized cotton.

5. Computation of costs of Chinese Venetian and filet laces ¹⁰

On account of the multiformity of Venetian lace, the cost is computed by the inch-yard, that is, 36 square inches set end to end. To obtain the cost of the medallions in a cloth, the square-inch content of each kind used is calculated and multiplied by the total number of motifs in the cloth. Average quality Venice motifs, during the height of the recent season (summer 1931), were obtainable at the rate of 55 to 60 cents Chinese currency, say 13½ to 15 cents United States currency; for these J. & P. Coats thread is used. For the very highest quality of work in which D.M.C. thread is used, the price

¹⁰ Taken from a report by Consul C. O. Spamer, Shanghai, Dec. 21, 1931.

will rise to as high as 90 cents, \$1 and even \$1.10 (Mexican) per inch-yard. A very poor quality, made with cheap Japanese thread, costs as little as 37 cents per inch-yard.

During the 4 months of June, July, August, and September, when the demand is strong for winter dress garniture, the price for Venetian lace will rise, only to fall to a lower level when the demand has been filled.

It may be of value to mention the comparatively small but steady demand for banquet cloths as well as bedspreads made entirely of Venetian point. To give an idea of the costs of producing this type of lace, there are given below two tables showing the relative value of labor and thread.

An average size banquet cloth, 108 by 72 inches, contains 7,776 square inches, or 216 yards one inch wide. At \$1.10 (Mexican) per yard, such a cloth would cost \$237.60 (Mexican), divided as follows:

TABLE 131.—Analysis of cost of Venetian lace banquet cloth

	Per inch- yard	For entire cloth	Percent
	<i>Dollars Mex.</i>	<i>Dollars Mex.</i>	
Value of thread.....	0.20	43.20	18
Labor.....	.70	151.20	64
Overhead.....	.10	21.60	9
Profit.....	.10	21.60	9
Total.....	1.10	237.60	100

At 50 cents (Mexican) per yard the cost would be divided thus:

	Per inch- yard	For entire cloth	Percent
	<i>Dollar Mex.</i>	<i>Dollars Mex.</i>	
Thread.....	0.15	32.40	30
Labor.....	.30	64.80	60
Overhead.....	.03	6.48	6
Profit.....	.02	4.32	4
Total.....	.50	108.00	100

The second accessory to an attractive banquet cloth is the so-called "filet" lace edge. The groundwork of this lace consists of a network of square meshes on which the pattern is worked by interlaced darning stitches and controlled by counting the meshes, or holes. For banquet cloths, from 30- to 40-hole filet is used. Since a fair quality of filet will measure 12 holes, or meshes, to the inch, it will be seen that a 40-hole edging will be about 3¼ inches wide. For napkins, a 6- to 9-hole filet is used.

The work on filet lace is paid for per yard, according to the number of holes, or meshes, in the width. The price fluctuates from 1¼ to 1½ cents per hole. The present price is between 1½ and 1¾ cents. Thirty-hole filet at this rate would, therefore, cost from 45 to 48 cents per yard (Chinese currency). One cent Chinese currency was equivalent in December 1931 to approximately ¼ cent United States currency.

In the cheaper laces, sold as yardage instead of as edging on banquet cloths, and also for the narrow lace known as picot, the price per yard will be considerably under the price per hole. For example, 6-hole picot will sell for $6\frac{1}{4}$ cents a yard instead of 9 cents at the $1\frac{1}{2}$ -cent-per-hole rate. Much of the yardage consists of filet which has been rejected as unfit for use as a border on linen cloths. There is, however, a cheaper quality made specially for the yardage trade.

For filet medallions used on some types of cloths and also for the large bedspreads known as "Russian filet" or "Sardo", the price will be paid by the 10,000 holes or meshes. The price for filet medallions is between $47\frac{1}{2}$ and 50 cents per 10,000 holes.

6. Chinese export trade in laces

The following table shows total exports of hand-made laces from China compared with exports to the United States for 1914 and from 1919 to 1933.

TABLE 132.—Total value of exports of Chinese hand-made lace and value of exports to the United States,¹ 1914 and 1919–33

[Chinese maritime customs statistics]

Year	Value of total exports from China (in Haikwan taels) ²	Value of exports to the United States (in Haikwan taels)	Percentage of total exports shipped to United States	Year	Value of total exports from China (in Haikwan taels) ²	Value of exports to the United States (in Haikwan taels)	Percentage of total exports shipped to United States
1914.....	139,842	402	0.29	1926 ³	4,585,298	3,402,527	74.21
1919.....	2,080,591	1,496,239	71.91	1927 ³	4,694,127	3,599,887	76.69
1920.....	2,678,530	1,743,802	65.10	1928 ³	3,132,355	2,345,502	74.88
1921.....	5,230,284	4,195,494	80.22	1929 ³	2,705,697	1,898,741	70.18
1922.....	5,640,845	3,844,632	68.16	1930 ³	3,196,062	2,327,898	72.84
1923.....	4,111,803	2,897,333	70.46	1931 ³	3,540,265	2,484,839	70.19
1924.....	4,639,680	3,359,302	72.40	1932 ³	2,208,124	1,512,239	68.49
1925 ³	4,270,663	2,898,965	67.88	1933 ³	3,281,628	1,684,758	51.34

¹ These Chinese statistics when converted showing exports to the United States do not check with American import statistics. Almost consistently these figures are larger than those shown in American "general imports from China." The explanation lies in the inclusion in Chinese statistics of other articles than lace and possibly also in the fact that some Chinese laces billed as destined to the United States are transhipped without entering into domestic statistics.

² The Haikwan tael is not a coin but a weight in silver, by means of which duties are paid to the Imperial customs. Its value in local currency varies in every trading port. Its value for the purpose of reckoning duties is published quarterly by the United States Treasury.

³ Lace trimmings.

⁴ Standard dollar.

The following table discloses the principal markets for Chinese laces in 1933.

TABLE 133.—Chinese exports¹ of lace and trimmings, 1933

Article no. 237—exported to—	Value in standard dollar	Article no. 237—exported to—	Value in standard dollar
United States of America.....	1,684,758	Other.....	656,666
Great Britain.....	363,144	Gross export.....	3,281,628
Netherlands India.....	172,398	Reimported from abroad.....	26,161
Germany.....	172,004	Net export.....	3,255,467
Canada.....	161,199		
Hong Kong.....	71,459		

¹ Of the total 78 percent was shipped from Shanghai, and 21 percent from Chefoo.

7. The future of the Chinese lace industry

Chinese hand-made lace, in spite of imperfections in certain types, has become a factor in international trade and its competition is felt by Belgium, France, and Italy, the European hand-made lace producers. Chinese filet and crochet laces are perfect, Cluny is improving, and a good start has been made on Venetian and Valenciennes. The patterns are few and are made in mass production. As yet, China does not compete in making the finest laces, but there is no reason to believe that Chinese laces will not improve with time. The Chinese so far have not originated any designs but have been content to copy. It is conceivable, however, that at some future date there might develop a real Chinese lace which will revolutionize the hand-made lace industry.

III. PRODUCTION IN OTHER COUNTRIES

Puerto Rico and the Philippines

A small quantity of fine quality narrow Valenciennes lace is made by hand in the Philippines and in Puerto Rico. Imports from the Philippine Islands are classed as "Laces, embroideries, etc., and articles made thereof (except wearing apparel), of cotton, n.s.p.f.", and there are no data to indicate the quantity and value of lace alone. Piña lace is, in fact, a combination of woven cloth, drawn work, and embroidery, made from the fiber of the pineapple leaf. It is delicate, soft, and transparent in texture with a slight tinge of pale yellow. It is used in handkerchiefs, and the introduction of other threads in the drawn work gives the appearance of fancy meshes of lace. A considerable quantity of hand-made torchon lace is produced in Puerto Rico in edges and insertions which vary in width from half an inch to 3 or 4 inches. There is little demand for wider widths. In addition to edgings and insertions, Puerto Rico also produces medallions and lace articles for trimming dresses. This torchon lace is called "mundillo", because formerly the lace was made on a pillow. The pillow is now superseded by a wooden cylinder similar to that used in China. This cylinder is 3 or 4 inches in diameter and 12 or 14 inches in length and is set in a frame so that it will revolve; wooden discs attached at the ends give to it the form of a spool. The surface of the cylinder contains holes in which pins are inserted at specified places in the design which is wrapped round the cylinder. The thread is wound on wooden bobbins which the operator passes over and under each other to weave the design, and the twists or plaits are secured by the pins. Threads which are temporarily out of use are inserted in niches cut for that purpose in the flanges of the cylinder. A small amount of filet lace, generally narrow and cheaper than the torchon lace, is also produced in the island.

The principal consideration is cheapness rather than quality, and this undesirable factor induces skilled workers to produce lace of a quality which is below their capacity and opens the industry to less dexterous workers. It is estimated that the demand for a cheap type of workmanship will eventually lead to the highly skilled workers abandoning the craft for other occupations. The schools and Government of Puerto Rico are endeavoring to encourage high standards of work and the use of better-grade materials.

The making of real lace was introduced into Indo-China 20 years ago by the French and is centered at Tonkin. The patterns are of Cluny, Venetian and crochet styles. Lace is also made in mission schools in the Nellore district, Madras Presidency, British India, and the Japanese are producing imitations of Honiton and Bruges lace.

IV. HAND-MADE LACE ARTICLES

1. Hand-made lace articles of coarse filet ground made in Belgium, France, Italy, and China

Articles made of hand-made lace which has a knotted filet net ground as a basis are imported into the United States in considerable quantities. These articles are constructed in a similar manner to those made in convents in foreign countries in medieval times for church decorations and are recorded as one of the forerunners of hand-made lace.

Originally these articles were called "Russian filet", and the better qualities "Sardo". The finer pieces are made in Belgium, France, and Italy, particularly in the Island of Sardinia. Some of the Belgian articles are made of colored threads, with one color for the filet ground and another for the darning, which constitutes the pattern.¹¹ In China they are also made, in coarse cheap grades, having been introduced into the Pootung district of Shanghai in 1925. The basic net is made at Ningpo by the fisher folk who understand netmaking. The material was originally linen, but at the present time cotton alone is used, though this is sometimes mercerized, and all the yarns are used in the gray. The knotting of threads into a square mesh or net is achieved by a simple instrument, which consists of a round wooden stick, the circumference determining the size of the square, or of a thin metal needle split at both ends for the purpose of holding the thread. A sand cushion is used and the net is a suitable ground for hand embroidery. The size of the meshes varies from 2 to 6 to the inch. Chinese lace articles are designated by two names—"Russian" and "Sardo", the former consisting of a heavy design on a heavy mesh and the latter of a heavy design on a finer mesh.

There are different methods of inserting the design, and several kinds of stitches are used: The darning stitch—point de toile; the festoon stitch—point de reprise; the ornamental festoon stitch—point d'esprit; pyramidal shapes within the square meshes; and relief or floating leaves in darning or festoon stitches. The objects are sometimes surrounded by much thicker outlining threads, used either singly or in pairs; the use of these extra threads serves to detract from the rigidity of the net foundation. These articles are known as "Richelieu."

Articles made of Chinese filet lace include table runners, squares, bedspreads, chair backs and arms. The table runners are made in sizes approximating 36, 45, 54, 63, 72 inches in length by 18 inches in width; squares are made in sizes of 36, 45, 54, and 72 inches; and bedspreads are made in sizes of 72 by 90, and 90 by 108 inches. The table runners or scarfs are sold in sets of 3 and 4; 13-piece luncheon sets consist of 12 doilies, 18 by 12 inches, and 1 scarf. Chair backs measure 18 by 12 inches.

¹¹ These articles are now well imitated on the Nottingham lace-curtain machines and are sold at a much lower price than the hand-made.

2. Hand-made lace articles other than filet

Popular hand-made lace articles other than filet are Venetian lace bedspreads or tablecloths, usually 72 by 108 inches, 13-piece luncheon sets, and scarf sets. These are imported from Belgium and from China. Sets of articles of the shapes and sizes previously described are imported from Italy and Belgium and consist of linen, edged with lace and with motifs inserted. Similar articles are imported from Le Puy in France. Other articles are coarse Bruges lace panels with a finished edge or fringe used for the bottom of window shades; these, 1½ yards in length, are sold wholesale at from \$1.75 to \$2 each. Exceptionally high priced imported articles such as banquet cloths, 4 by 2 yards of Venetian lace with a Point Milan center, are sold for \$500 and upward.

V. IMPORTS OF HAND-MADE LACES AND LACE ARTICLES INTO THE UNITED STATES

1. Imports for consumption and general imports

Imports of hand-made laces into the United States are fairly substantial. Table 134 tabulates imports of cotton, flax, and silk hand-made laces from 1912 to 1933, and imports of rayon hand-made laces from 1930-1933.

TABLE 134.—Total hand-made laces: Imports for consumption, 1912-33

Year	Cotton	Flax, etc.	Silk	Rayon	Total
<i>Fiscal</i>					
1912.....	\$909,075	\$34,371	\$8,418	-----	\$1,002,364
1913.....	671,805	52,545	1,152	-----	725,502
1914 (July 1-Oct. 3).....	51,433	2,691	32	-----	54,206
1914 (Oct. 4, 1913-June 30, 1914).....	146,320	7,648	91	-----	154,059
1915.....	42,817	2,952	780	-----	46,549
1916.....	208,057	79,188	24,345	-----	311,590
1917.....	730,471	77,807	16,371	-----	824,649
1918.....	663,387	133,003	10,392	-----	806,782
1918 (July 1-Dec. 31).....	76,436	14,332	4,933	-----	95,701
<i>Calendar</i>					
1919.....	913,350	33,065	28,269	-----	974,684
1920.....	986,499	31,854	81,439	-----	1,099,842
1921.....	570,358	46,335	122,722	-----	739,415
1922 (Jan. 1-Sept. 21).....	1,786,273	35,447	71,911	-----	1,893,631
1922 (Sept. 22-Dec. 31).....	589,134	30,570	19,637	-----	639,341
1923.....	1,944,550	389,943	76,368	-----	2,410,861
1924.....	2,125,728	168,143	34,048	-----	2,327,919
1925.....	1,566,194	193,220	17,840	-----	1,777,254
1926.....	1,005,803	153,511	32,089	-----	1,191,403
1927.....	1,224,856	125,130	16,584	-----	1,366,570
1928.....	777,585	22,472	8,396	-----	808,453
1929.....	596,080	31,838	8,095	-----	636,013
1930 (Jan. 1-June 17).....	193,573	4,766	328	-----	198,667
1930 (June 18-Dec. 31).....	201,119	16,912	3,524	\$696	222,251
1931.....	444,364	10,608	1,657	572	457,201
1932.....	337,382	2,371	272	77	340,102
1933.....	286,929	7,569	-----	-----	294,498

Perhaps the outstanding fact disclosed by the table is the large increase in imports under the Tariff Act of 1922, most of which increase was made up of importations from China. The increase is significant, as the duty was raised from 60 to 90 percent.

Table 135 shows general imports of hand-made laces into the United States from 1912 to 1933 and classifies them according to countries of origin.

TABLE 135.—Cotton hand-made laces^{1,2}: Value of general imports into the United States, by countries, 1912-33

Year	China	Italy	Belgium	France	Germany	Switzerland	United Kingdom	Japan	All other:	Total
<i>Fiscal</i>										
1912.....	\$180	\$13,203	\$15,905	\$102,987	\$75,384	\$150,094	\$23,311	\$42,524	\$451,528	\$875,116
1913.....	364	39,161	9,538	71,806	118,155	51,434	8,925	91,708	343,667	600,058
1914.....	166	21,812	6,297	22,036	25,539	5,747	13,681	890	180,208	276,377
1915.....	352	17,852	145	1,810	286	14	2,668	95	25,975	49,197
1916.....	2,542	40,334	1,633	89,544	64	3,960	7,286	58,038	6,665	210,086
1917.....	113,467	329,204	1,777	137,632	-----	14,404	31,209	65,159	4,061	687,003
1918.....	362,413	124,364	1,431	62,421	-----	18,927	42,022	35,054	13,821	660,463
1918 (July 1-Dec. 31).....	10,328	15,052	-----	17,713	-----	2,914	19,322	-----	919	66,248
<i>Calendar</i>										
1919.....	641,963	41,020	38,547	101,198	-----	14,823	73,400	3,783	10,814	925,608
1920.....	434,438	15,081	67,797	201,987	20,701	97,569	130,886	3,567	49,147	1,021,173
1921.....	353,277	20,748	33,622	94,632	25,801	15,669	20,822	30	24,568	559,219
1922.....	2,152,435	30,513	21,075	40,017	10,315	4,775	4,701	19,825	31,963	2,325,623
1923.....	1,818,443	63,327	42,172	112,293	51,515	37,687	24,474	4,902	13,561	2,108,504
1924.....	1,813,257	63,634	49,086	49,566	39,016	28,342	23,003	11,184	6,268	2,083,357
1925.....	1,452,071	56,045	62,384	34,010	13,787	2,554	1,911	326	32,471	1,685,559
1926.....	807,598	61,413	29,009	48,867	18,424	3,433	2,587	1,904	9,378	922,013
1927.....	1,146,957	45,599	25,274	41,306	2,130	424	2,211	577	1,406	1,265,884
1928.....	641,039	14,979	28,669	25,283	2,464	3,371	-----	643	2,748	719,556
1929.....	531,128	18,791	27,125	2,040	5,496	28	180	-----	2,636	587,424
1930.....	425,846	24,825	29,866	41,538	-----	-----	-----	-----	1,349	523,424
1931.....	310,960	65,923	18,149	37,103	-----	-----	114	-----	177	432,426
1932.....	332,189	34,270	5,352	14,896	-----	-----	-----	-----	-----	386,707
1933.....	243,788	14,953	3,497	1,506	-----	-----	-----	-----	-----	263,744
Total for 22½ years.....	13,605,201	1,202,193	518,650	1,362,241	409,077	456,509	432,773	340,213	1,338,332	19,655,189
Percent of total.....	69.22	6.12	2.64	6.88	2.08	2.32	2.20	1.73	6.81	100.00

¹ Recorded as "Laces and lace articles, including lace edgings, insertings, and galloons—hand made" from 1912 to 1933, inclusive.

² Net including receipts from Philippine Islands (free) 1912, \$864; 1913, \$32; 1914, \$214; 1915, \$279; 1917, \$283; 1918, \$2,338.

³ Turkey was main source of the "all other" imports in 1912, 1913, and 1914.

Imports of hand-made lace are entered largely through New York and, secondarily, through San Francisco.

TABLE 136.—Hand-made laces: Average annual imports for consumption under the Tariff Acts of 1913 and 1922

Act of—	Cotton	Flax, etc.	Silk	Total
1913.....	\$682,519	\$51,449	\$40,267	\$774,235
1922.....	1,294,614	144,604	27,560	1,466,778
Percent of increase, act of 1922 over act of 1913.....	89.68	181.06	—31.56	89.45

Exports of hand-made laces of foreign origin were recorded from July 1, 1911, to December 31, 1921, and during these 10½ years the value of such exports was \$32,193, with an annual average of \$3,066. The year of largest exports was 1913, with a total of \$9,026.

2. Imports of lace articles

Table 137 shows by materials, total imports for consumption from 1918 to 1933 of articles made in part of lace.

Table 138 shows by countries general imports (necessarily slightly different from imports for consumption) of cotton lace articles from 1922 to 1933. Imports from China, which accounted for about 12 percent of total imports in 1923, increased to the point of supplying over 65 percent in 1933.

TABLE 137.—Articles, including napkins, made in part of lace n.e.s.: Imports for consumption, 1918-33

Year	Cotton	Flax, etc.	Silk	Rayon	Total
1918 (July 1-Dec. 31).....	\$99,320	\$46,565	\$158,954	-----	\$304,839
1919.....	344,679	77,117	22,842	-----	444,638
1920.....	854,502	167,315	50,031	-----	1,071,848
1921.....	687,770	234,370	56,298	-----	978,438
1922 (Jan. 1-Sept. 21).....	604,325	160,737	52,531	-----	817,593
1922 (Sept. 22-Dec. 31).....	238,333	-----	99,019	-----	337,352
1923.....	1,114,845	-----	323,393	-----	1,438,238
1924.....	1,300,955	843,105	371,819	-----	2,515,879
1925.....	1,268,355	1,110,403	398,074	-----	2,776,832
1926.....	1,222,589	923,133	414,320	-----	2,560,042
1927.....	1,282,835	657,463	282,860	-----	2,223,158
1928.....	1,463,841	434,259	153,813	-----	2,056,913
1929.....	1,307,781	407,932	111,560	-----	1,827,273
1930 (Jan. 1-June 17).....	597,731	180,418	27,927	-----	796,076
1930 (June 18-Dec. 31).....	435,664	76,590	60,973	\$3,932	577,159
1931.....	615,672	69,876	45,456	3,767	734,771
1932.....	326,391	36,923	20,613	3,615	387,542
1933.....	214,012	43,827	16,714	5,341	279,894

TABLE 138.—Cotton articles in part of lace: General imports by countries, 1922-33

Year	China	Germany	France	Belgium	All other	Total
1922 (Sept. 22-Dec. 31).....	\$26,933	\$94,634	\$36,758	\$12,234	\$100,387	\$270,953
1923.....	150,420	368,255	237,811	48,055	549,913	1,264,465
1924.....	262,428	286,736	376,497	72,321	395,029	1,393,011
1925.....	315,031	249,856	332,105	85,443	273,527	1,255,972
1926.....	353,186	238,238	296,205	103,018	246,348	1,236,995
1927.....	474,767	273,717	222,340	173,387	234,555	1,378,766
1928.....	628,024	254,343	164,695	162,423	264,518	1,474,008
1929.....	511,332	333,667	163,995	148,500	207,167	1,364,661
1930.....	494,145	177,287	99,502	79,728	152,281	992,943
1931.....	395,754	60,366	33,832	25,839	109,635	615,426
1932.....	231,435	47,027	15,590	5,871	51,547	351,520
1933.....	134,355	12,270	8,278	12,316	39,325	206,544

3. Importers and the mark-up

Hand-made laces are imported by wholesale lace importers and by department stores. In fact, most of the wholesale importers of hand-made laces are American merchants of Syrian extraction who deal also in fine machine-made laces and lace articles and oriental rugs. The finest hand-made laces are imported and sold by department stores. All department stores carry Chinese hand-made laces; many of them sell commercial European hand-made laces of narrow widths and of medium prices, but the sale of elaborate and high-priced lace articles and rare and costly laces is confined to the largest stores with a wealthy clientele. The quantity of laces carried in stock by wholesalers is usually not large; but the high price of the article and the large number of patterns and styles which must be kept even in a stock of moderate dimensions entail the investment of a large amount of capital.

(a) *Mark-up on Chinese hand-made laces.*—The wholesale prices at which Chinese hand-made laces are actually sold depends upon the season of the year, the popularity of the lace, and the size of the order. The importer's mark-up, the percentage added by the importer to the landed cost to obtain the selling price, on Chinese laces as supplied by five New York importers averaged 44.25. Details are shown in the following table.

TABLE 139.—Mark-up on Chinese hand-made laces at New York, 1927 to 1929¹

Company number	Tatting, Vals, Ven- ise	Cluny	Filet	Crochet
	Percent	Percent	Percent	Percent
1.....	48.92	47.38	37.09	54.47
2.....	44.25	44.25	23.93	40.81
3.....	63.04	32.01	25.54	27.04
4.....		62.11	26.30	66.68
5.....			27.79	30.35
Weighted average.....	49.80	53.02	27.04	53.48

¹ The 5 firms from whom data were obtained imported in the 2 years July 1, 1927, to June 30, 1929, 23 per cent of total imports of hand-made laces into the United States. The investigation was made by the Tariff Commission during 1931 and 1932.

The mark-up was lowest on filet laces. The higher mark-up on Valenciennes and Venise was due partly to the small volume, and on Cluny and crochet, to the popularity of the laces at the time.

(b) *The mark-up on articles made partly of lace.*—During the same investigation the mark-up on lace articles was ascertained, 18.55 percent of total imports of lace articles in the 2-year period being studied. It was found that the average mark-up on Chinese filet was 21.71 percent and on Venetian 30.05 percent. The weighted average mark-up on European hand-made lace articles was 58.83 percent, whereas the average mark-up on all the imported lace articles studied was 24.61 percent. The data tabulated below reveal the largest mark-up on imported lace articles from Belgium, the second largest on articles from Italy, the third largest on articles from France, and the smallest mark-up on Chinese lace articles.

TABLE 140.—Mark-up on articles in part of lace in New York, 1927 to 1929

Company number	China	Belgium	France	Italy
	Percent	Percent	Percent	Percent
1.....	24.61			
2.....				75.67
3.....			83.45	
4.....	27.33			
5.....	20.94			
6.....	18.64			
7.....	24.58			
8.....			56.81	
9.....		101.90	38.85	
10.....				
Weighted average.....	22.04	101.90	56.38	75.67

¹ Machine-made lace (Normandie).

² Machine-made lace (Lyon Alençon).

VI. PRICES

Prices of European hand-made laces depend upon the width, style, and material and, with lace articles, upon the size. Individual foreign firms issue their own descriptive catalogs with prices, but there are no basic lists. One Parisian house issued a post-war catalog in 1922, but prices varied with the fluctuation of the value of the franc and at the date of the franc stabilization were multiplied by 4 or 5 according to the article. These values during post-war years would have varied little according to the gold standard, being affected mainly by scarcity.

Wholesale prices

Wholesale trade in European hand-made laces in the United States is largely in the hands of American citizens of Syrian origin and is

mainly restricted to such styles as have taken their place as necessities in the economics of American women. The trade in higher-priced laces, in laces of historic interest, and in such laces as may be classed as works of art, falls almost entirely to the large department stores and specialty shops. Wholesale trade in this country in European hand-made laces in 1932 appeared to be mainly restricted to Belgian mi-manuelle laces of the Princess, Luxeuil, and Appliqué styles; sales of Belgian Binche and Valenciennes laces were small. On Belgian hand-made lace this weighted average mark-up, as found in the investigation by the Tariff Commission in 1931-32, was of 78.77 percent.

Chinese hand-made laces are imported and sold in large quantities. The limitation of styles and patterns results in extensive orders of certain widths being placed abroad periodically, such as 15,000 yards of the filet pattern, rose and leaf, every third week, and a narrow Irish picot in quantities of 40,000 yards every fifth week, these being the orders of one firm. Styles of hand-made laces consist of filet, crochet, Cluny, and Venetian with such variations as tatting, antique, and embroidered filet. Crochet edges sell in larger quantities than insertions. Ordinarily laces of the crochet and filet styles are imported in equal quantities, but the sudden demand for crochet lace early in 1932 was so insistent that merchants sold their entire stock, including seconds and soiled laces.

Wholesale prices of Chinese hand-made laces and lace articles as furnished by a large wholesale merchant of these commodities for the year 1933, subject to terms of 3 percent, 10 days, are shown in tables 141 and 142. The trend of prices during recent years has been downward, the decline being due to a falling demand and the decline of prices in China.

TABLE 141.—Wholesale prices per yard of Chinese hand-made laces in New York December 1933

[Cotton tax included in price]

Style	Width	Price per yard	Style	Width	Price per yard
Picots:	<i>Inch</i>		Cluny:	<i>Inch</i>	
Woochow.....	$\frac{3}{8}$	\$0.03	Picot.....	$\frac{1}{2}$	\$0.04
Tsingpoo.....	$\frac{3}{8}$	.03½	Edge.....	$\frac{3}{4}$	.05
Do.....	$\frac{1}{2}$	.05	Do.....	$\frac{3}{8}$	.05
Finest Swatow.....	$\frac{1}{2}$	.07½	Do.....	1	.06
Shamrock.....	$\frac{3}{8}$	.10	Do.....	$\frac{1}{2}$	.07½
Cluny.....	$\frac{1}{2}$	.04	Do.....	$\frac{1}{2}$	.09
Narrow filet:	<i>Hole</i>		Do.....	$\frac{1}{2}$	.10
Insertion.....	5	.04½	Butterfly edge.....	1	.10
Picot.....	6	.05	Do.....	1½	.10
Insertion (cross pattern).....	7	.08½	Swatow filet, buttonhole edge:	<i>Hole</i>	
Edge (cross pattern).....	9	.10	Edge (cross pattern).....	6	.09
Insertion (heart pattern).....	8	.10	Do.....	9	.13½
Edge (heart pattern).....	9	.10	Edge (heart pattern).....	9	.13½
Armenian.....	<i>Inch</i>		Edge.....	12	.18
Tatting.....	$\frac{3}{8}$	.12	Do.....	18	.26
Do.....	$\frac{3}{8}$	.04½	Do.....	18	.26
Do.....	$\frac{3}{8}$	.09	Do.....	30	.45
Do.....	$\frac{1}{2}$	.11½	Do.....	30	.45
Swatow crochet:			Shanghai filet:		
Insertion.....	1½	.20	Edge.....	12	.13½
Edge.....	1½	.25	Do.....	12	.13½
Insertion.....	<i>Bean</i>		Do.....	13	.15
Edge.....	1	.27½	Do.....	16	.18
Insertion.....	1	.30	Insertion (rose and leaf).....	18	.20
Edge.....	2	.32½	Edge (rose and leaf).....	19	.20
Insertion.....	2	.35	Edge.....	24	.30
Edge.....	3	.37½	Do.....	30	.37½
Insertion.....	3	.40			
Edge.....	3	.40			

NOTE.—Point Venise in all widths at 40¢ per inch-yard.

TABLE 142.—*Wholesale prices of Chinese hand-made filet-lace articles in New York, December 1933*

[Cotton tax included in price]

Article	Size	Price
Russian filet, 4 meshes;		
Table-covers or spreads.....	72 by 90 inches.....	\$1 each.
Squares.....	72 by 72 inches.....	\$0.92½ each
4-piece scarf sets.....		\$0.80 set.
Chair backs.....	10 by 14 inches.....	\$0.52½ dozen.
Large chair backs.....		\$0.67½ dozen.
Chair back sets.....	2 dozen arm rests.....	\$1.07½ set.
	1 dozen chair backs.....	
Arm rests.....		\$0.27½ dozen.
Ovals and oblongs.....	10 by 14 inches.....	\$0.52½ dozen.
Squares.....	36 by 36 inches.....	\$0.32½ each.
Do.....	54 by 54 inches.....	\$0.67½ each.
Russian antique vine design:		
Squares.....	36 by 36 inches.....	\$0.50 each.
Oblongs.....	54 by 90 inches.....	\$1.35 each.
Do.....	72 by 108 inches.....	\$1.75 each.
Mercerized Sardo (2-tone).....	72 by 90 inches.....	\$4.75 each.
Do.....	72 by 108 inches.....	\$5.50 each.
2-tone mercerized Russian filet:		
Squares.....	36 by 36 inches.....	\$0.67½ each.
Do.....	54 by 54 inches.....	\$1.35 each.
Do.....	72 by 72 inches.....	\$2.35 each.
Oblongs.....	54 by 90 inches.....	\$2.25 each.
Do.....	72 by 90 inches.....	\$2.75 each.
Do.....	72 by 108 inches.....	\$3.50 each.
Do.....	72 by 144 inches.....	\$8.50 each.
4-piece scarf sets.....		\$1.75 set.
Oblongs.....	10 by 14 inches.....	\$0.95 dozen.
Do.....	12 by 18 inches.....	\$1.35 dozen.
Chair backs.....		Do.
Chair back sets.....	2 dozen arm rests.....	\$2.45 dozen sets.
	1 dozen chair backs.....	
Lace dollies:		
Filet.....	6-inch, round.....	\$0.42½ dozen.
Crochet.....	Do.....	Do.
Cluny.....	Do.....	Do.
Point Venise.....	Do.....	\$1.10 dozen.

Retail prices

Hand-made laces are retailed in varying quantities in most department stores and also in smaller stores of specific types. Practically all department stores carry Chinese hand-made laces, many of them sell commercial European hand-made laces of narrow widths and of low and medium prices, collars, handkerchiefs, etc., whereas the sale of elaborate and high-priced articles and rare and costly laces is mostly confined to the largest of them, where the investment in the stock of hand-made laces may amount to as much as \$250,000, and price is not of so much moment to the clientèle. In the case of hand-made laces of high artistic nature, where rarity or elaboration of hand work is the dominant factor, the profit taken is large, but the retail buyer, when the purchase is made, takes a high risk, and, not knowing how long the article may be retained before it is sold, adds such a mark-up as may be reasonably expected to cover interest charges on the purchase price during a period of time. The purchase of these laces by retail stores is made in restricted quantities, but the range of the narrow styles of lace, such as Point Binche and Valenciennes, is large, one store showing 150 patterns of the former and 100 patterns of the latter.

A New York department store carries a stock of European hand-made laces, consisting of 27 different styles and widths, at prices varying from 24 cents per yard for an Armenian edge of one-fourth of

an inch, to \$675 per yard for a Rose Point flounce of 18 inches in width. Hand-made lace articles of wearing apparel, such as bridal veils, collars, and scarfs, vary in price from \$4.85 for a small Duchesse collar to \$1,450 for an egg-shaped bridal veil, 3¼ yards by 2¼ yards, of Rose Point.

Some hand-made lace articles—albs, rochets, surplices, and antependiums—made for ecclesiastical purposes, have designs containing crosses and other symbolic figures. The styles are Bruges, Milanese, Duchesse, Point Lierre, and Princess. Albs of Duchesse lace are the most expensive of these articles and are followed by altar cloths of Bruges lace.

A further study of the extent to which hand-made laces and lace articles are sold in a medium-sized city was made at 5 department stores and 4 specialty shops in Washington. Only 3 of the stores carried European hand-made lace. Ten styles of lace were carried, and the highest price was \$25 per yard for a 7-inch Duchesse with Rose Point. One store and one specialty shop carried lace articles in limited numbers. Nine styles of hand-made lace collars were offered for sale, at prices ranging from \$2 for a small collar of Bruges lace to \$65 for a collar of Rosaline point, and at \$100 for a collar, 6 inches in width, of Rose Point.

Prices paid for antique laces by collectors, such as the late Senator Clark, some of whose specimens are now permanently exhibited in the Corcoran Art Gallery in Washington, are not commercial prices and vary with the scarcity and state of preservation of the articles; these prices mount to thousands of dollars. Interesting particulars concerning them are to be found in chapter XIV of "Chats on Old Lace and Needlework", by Mrs. Lowe. The same remarks apply to the purchase of laces for exhibition purposes in public museums, such as those displayed at the Metropolitan Museum of Art in New York or at the Brooklyn Museum. Works of art and collections in illustration of the progress of the arts, imported for exhibition by any State or by any society or institution established for the encouragement of the arts, are admitted free of duty, subject to such regulations as the Secretary of the Treasury may prescribe, under paragraphs 1809 and 1811 of the Tariff Act of 1930.

VII. THE TARIFF ON HAND-MADE LACE AND ITS PURPOSES

No distinction is made in rates of duty on hand-made and machine-made laces in the tariff acts of the United States.

Hand-made lace is not produced on a commercial scale in the United States, nor is it likely to be, because of the apparent unwillingness of American women to undertake such exacting and unprofitable work. All narrow laces of the same material may be said to compete with each other when they are similar in weight, width, and style. Most machine-made laces were originated as imitations of certain styles of European hand-made laces, and some of these machine-made laces are direct competitors with the hand-made product. Recently the situation has been reversed, as Chinese hand-made laces are produced and sold at such low prices that in some instances they are being used as substitutes for Barmen laces and for certain styles of Levers laces. No direct competition is offered by hand-made laces to machine-made

laces of wool, rayon, or metal threads, nor upon such styles as cotton bobbin finings and Spanish style laces; hand-made linen or silk lace exceeds in price the machine-made article by such a margin that "preferential substitution" rather than "competition" results.

Table 143 shows the domestic production of Levers laces as recorded by the Bureau of the Census; the landed value of imports for consumption of hand-made laces in census years; and the ratio of imports of hand-made laces to the domestic production of Levers laces.

TABLE 143.—Domestic production of Levers laces, landed value of imports for consumption of hand-made laces, and ratio of imports of hand-made laces to domestic production of Levers laces—Census years 1914 to 1931

Year	Domestic production of Levers laces	Landed value, imports for consumption, hand-made laces	Ratio of imports of hand-made laces to domestic production of Levers laces	Year	Domestic production of Levers laces	Landed value, imports for consumption, hand-made laces	Ratio of imports of hand-made laces to domestic production of Levers laces
			Percent				Percent
1914.....	\$5,009,975	\$343,509	6.96	1925.....	\$7,873,447	\$3,510,077	44.58
1919.....	12,432,905	1,632,596	13.13	1927.....	6,262,931	2,688,976	43.09
1921.....	6,833,022	1,238,520	18.13	1929.....	8,755,972	1,256,126	14.35
1923.....	10,922,216	4,761,450	43.59	1931.....	7,305,089	902,972	12.36

¹ Foreign value plus 60 percent ad valorem duty plus 7½ percent landing charges.

² Foreign value plus 90 percent ad valorem duty plus 7½ percent landing charges.

It will be noted that from 1923 to 1927 the landed value of imports of hand-made laces approximated to half the total value of the domestic production of Levers laces.

Hand-made laces are of two classes: European which are artistic, if not works of art, and Chinese, which are commercial. From time to time a question has arisen concerning the application of a different rate of duty for hand-made laces of high value which, by reason of the price, are noncompetitive with the products of the domestic industry.

The differences in hand-made lace were recognized in Great Britain in 1923, when the interim report of the committee of inquiry, appointed by the British Board of Trade, upon an application for the protection of lace under the Safeguarding of Industries Act, made the following suggestion:

We have included hand-made lace in our recommendation because certain kinds enter into strong competition with machine-made lace, but it is not necessary for the protection of the British machine-made lace industry that the proposed duty should be levied *ad valorem* on hand-made lace of high value. We recommend, therefore, that the assessment of the value of hand-made lace for the purposes of the duty should be subject to a maximum limit, which, while adequate to protect the Nottingham industry, would not represent a serious addition to the cost of an expensive lace. This limit, for example, might be defined as a specific amount per square foot of lace; and this amount might be based on the wholesale price of the most costly machine-made lace of the same material.

The final report of the committee in 1925 adopted the suggestion made in the interim report, but Parliament passed a bill assessing a duty of 33½ percent on machine-made and hand-made lace, irrespective of the value of the latter.

A specific duty by weight would also have the effect of assessing a higher ad valorem duty on coarse-yarn laces, which are competitive with some of the products of the domestic machine-made lace industry, than on high-priced fine-yarn laces of light weight.

CHAPTER VII

SUNDRIES

Paragraph 1529 (a) includes not only laces and embroideries but many articles which do not partake of the characteristics of either, such as woven goods, fancy tapes, and plain braids, also some ornamental articles which are not necessarily even composed of textile material.

Of the many items specifically mentioned in the first part of paragraph 1529 (a), five—flouncings, insertings, all-overs, galloons, and edgings—are characteristic lace shapes but may or may not be lace; four more of them—neck ruffings, flutings, ruchings, and tuckings—are mostly of woven materials. Five other items classified with and subject to the same rate of duty as elaborate laces are trimmings, fringes, gimps, ornaments, and braids (including common braided shoe laces). Four more items are composed either wholly or in part of lace: lace window curtains, n.s.p.f., veils, veilings, and quillings; these are the products of a variety of lace machines, including the Levers and the bobbinet, and the Bonnaz and Cornely sewing machines.

Various other fabrics or articles composed either wholly or partly of lace are dutiable at 90 percent ad valorem under paragraph 1529 (a). All articles, whether wholly or in part of lace, with specific exception of those mentioned in certain paragraphs, are dutiable at the lace rate of 90 percent ad valorem under the one paragraph 1529 (a).

I. TUCKINGS, FLOUNCINGS, AND ALL-OVERS

Imports of tuckings, flouncings, and all-overs, other than of lace, are unimportant. Occasionally limited quantities of tucked linen are imported for use in making the fronts of dress shirts. Imports of these articles made of material other than lace are shown in the following table:

TABLE 144.—Tuckings, flouncings, and all-overs, other than of lace: Imports for consumption, 1918–33

Year	Cotton ¹	Flax, etc. ²	Silk ^{1,3}	Rayon	Total
1918 (July 1–Dec. 31).....	\$147	-----	\$1,526	-----	\$1,673
1919.....	2	-----	754	-----	756
1920.....	5,958	-----	7,112	-----	13,070
1921.....	8,096	-----	45,231	-----	53,327
1922 (Jan. 1–Sept. 21).....	2,021	-----	11,208	-----	13,229
1922 (Sept. 22–Dec. 31).....	3,714	-----	1,506	-----	5,220
1923.....	11,704	\$1,515	7,174	-----	20,393
1924.....	7,424	162	1,888	-----	9,474
1925.....	11,040	-----	2,696	-----	13,736
1926.....	6,811	336	3,757	-----	10,904
1927.....	3,578	86	2,036	-----	5,700
1928.....	4,444	6	584	-----	5,034
1929.....	2,940	-----	3,237	-----	6,177
1930 (Jan. 1–June 17).....	1,771	-----	380	-----	2,151
1930 (June 18–Dec. 31).....	1,169	-----	\$1,192	\$622	2,983
1931.....	11,116	-----	\$32,573	\$2,042	45,731
1932.....	56,527	-----	\$9,003	\$3,837	69,367
1933.....	58,348	-----	\$1,324	\$2,787	62,459

¹ Not separately recorded prior to July 1, 1918.

² Not separately recorded prior to Sept. 22, 1922.

³ Tuckings and flouncings.

⁴ Includes flutings, quillings, neck ruffings, and ruchings.

II. LACE WINDOW CURTAINS, N.S.P.F.

1. Swiss embroidered curtains

The principal item comprised in the classification *Lace window curtains, n.s.p.f.*, is the type known as "Swiss embroidered curtains"; imports of these curtains are largely from Switzerland. Other types of curtains in this classification, imported in small amounts, are hand-made lace window curtains, chiefly of the *filet* and *Richelieu* styles.

Swiss embroidered curtains are made by cutting pieces of bobbinet into certain lengths and widths and ornamenting them with cut-out woven shapes sewed on to the basic fabric with a fancy embroidery stitch by the operation of the *Bonnaz*, *Cornely*, or similar sewing machine. These curtains are largely used by hotels and by many types of public and private institutions, and for such use are frequently decorated with monograms, names, or coats of arms. Swiss embroidered curtains are usually higher in price than the *Nottingham* lace curtain and appeal to different classes of purchasers.

Swiss embroidered curtains are known, according to the style and method of construction, by various names—Irish Point, Brussels, Tambour, Marie Antoinette, Battenberg or Renaissance, and Point de Venise. Irish Point curtains are sometimes very elaborate. In addition to being embroidered by the *Bonnaz* machine, they may contain a large amount of hand work, such as cutting out part of the cloth, spider-work in which the space left by the cut-work is hand-filled with brides, and cushion-work in which raised effects are produced by heavy embroidering with thick cotton. Brussels curtains are of two kinds, Saxony Brussels and Swiss Brussels. Saxony Brussels curtains have a delicate appearance created by superimposing one layer of net on the other. Sometimes the upper layer of net is of a different color from the lower one. The objects of double thickness are trimmed around the edges, and the pattern appears to be of a finer quality. Swiss Brussels curtains are made by filling up the objects with fine-thread *Bonnaz* work. Battenberg or Renaissance curtains are made by grouping braid or tape into designs and stitching them on to the net. Point de Venise curtains are made by embroidering the net with a chain stitch. The designs are made with the embroidery thread only, without any woven cloth being appliquéd on to the basic material. This style is now made in varied combinations of colors.

The designs of embroidered Swiss curtains are usually such as to allow the worker to embroider the pattern continuously to the net without cutting the embroidery threads. This is impossible, of course, if the design has detached objects. The designs of Swiss embroidered curtains made in pairs cover the bottom and both edges, the edge in the center of the window usually being more elaborate than the other, and the corner is important. Ordinarily there is no embroidery at the top of the curtain. Other window decorations are short curtains known as "stores", these being imitations of Belgian hand-made articles, and *brise-bise* nets. Stores are hung at the lower end of the shades made of other material; the design necessarily is at the bottom of the curtain and must not be thick, for when the shade is raised the curtain is rolled around the roller. The designer should know the possibilities of the machine's production; for instance, the lines of 2-thread embroidery may cross occasionally, but the chain stitch of 3-thread embroidery is so very thick that crossing is not advisable. *Brise-bise* curtains are hung horizontally and cover the

lower half of the window, and the design is frequently reversed on each side of a central line or figure. Upholstery articles, such as bedspreads and table covers, are also made in the same manner as Swiss embroidered curtains. The following are the processes by which Swiss embroidered curtains are made:

1. The design is drawn on paper.
2. The paper on which the design has been drawn is perforated on the edges of the motifs or shapes.
3. The paper is then smoothed with pumice stone.
4. Black dust is rubbed through the perforations to ascertain if the pricking is complete.
5. The design is placed over the muslin or other fabric which is to be used for the motifs, and a liquid paste rubbed over it which penetrates through the perforations and thus outlines the design on the fabric.
6. The fabric is placed over a section of net, of suitable quality for the style, and cut to such a size as is required by the desired article.
7. Portions of the cloth are cut away to make the necessary openings for hand-needlework, and the tambour spiderwork is inserted.
8. Cushionwork, consisting of long stitches of thick yarn to give a raised effect, is put on.
9. The work of the *Bonnaz* or *Cornely* machine is superimposed. This is worked through both the cloth fabric and the net.
10. The outlining of the motifs being complete, the superfluous cloth is cut away.
11. The muslin is further embroidered with fine details when necessary.
12. The edges are festooned and scalloped.
13. The curtains are bleached or dyed.
14. Finished and ironed or pressed, and
15. Folded and put up for the market.

The *Bonnaz* machine, patented in 1863, was derived from the sewing machine, and the basic construction and general appearance are similar to those of the *point de chainette* machine; it was first used for embroidery on fabric alone. The *Cornely* machine is a variation of the *Bonnaz* machine. According to "*Dentelles Françaises et Etrangères*", by Marguerite Charles and L. Pagès there are seven types of these fancy-stitch machines. They are capable of producing 2-, 3-, or 4-thread embroidery which is thereby made much more voluminous, but the chain stitch and 2- or 3-thread cords are the stitches most used commercially. The material to be embroidered is placed on the machine, which is driven by the foot or power and guided by the left hand, and underneath the machine is a handle with which the right hand controls the position of the needle as the embroidering is performed without displacement of the material. The operator in order to do the work well should be able to commence the embroidery at one end and, following the design, turn and double until the end of the pattern is reached.

(a) *Domestic production*.—No census data are available concerning the domestic production of Swiss embroidered curtains; it is known, however, that only 1 or 2 firms are intermittently engaged in their production. Only the simpler styles are made in this country. The reasons for the small production in this country and for the complete absence of production of elaborate articles are: First, the relatively high cost of labor for handwork in this country as compared with Switzerland; and second, the lack of skilled workers to perform this meticulous embroidery. An attempt to reduce the cost of production was made by experimentation upon a chain machine which stitched designs upon 12 pairs of curtains at once. The results were unsatisfactory. The sewing machines used for embroidering are imported, paying a duty of 30 percent. The muslin, lawn, cambric,

and other cotton cloths, as well as the thread used in the domestic industry, are of domestic manufacture; bobbinet can be obtained in this country but is usually imported. The articles are made as pairs of curtains, and panels, the latter being of such a width that one will cover an entire window. Sizes of curtains are 2½ to 3 yards in length and 36 to 48 inches in width.

(b) *Foreign production.*—Switzerland, of course, is the principal producing country of Swiss embroidered curtains; the industry is centered in the cantons of St. Gall and Appenzell, and in the towns of Rheineck, Walsenhausen, Trogentown, and Buhlet. There is a small production in the neighboring territory of Austria. All of the Swiss manufacturers are members of the Kettenstichverband; some have their own factories where every process, except the bleaching, is carried on; others give out the work to people who live in the country, supplying both machines and materials. Home work is produced at a slightly cheaper rate than that done in the factories. Workers in mills must serve an apprenticeship of 3 years.

2. Hand-made lace window curtains

A small proportion of "lace window curtains, n.s.p.f." consists of hand-made lace curtains, principally from China but also from Belgium, France, and Italy. These curtains are largely the coarse filet styles known as Russian, Sardo, and Richelieu. As these styles have been mentioned in the chapter dealing with hand-made lace they need not be further discussed.

3. Imports

(a) *Imports for consumption.*—As previously explained, "lace window curtains, n.s.p.f." means all lace window curtains, except those made on the Nottingham lace-curtain machine. Table 145 tabulates imports of lace window curtains, n.s.p.f., from 1912 to 1933. These imports consist largely of Swiss embroidered curtains, most of which are of a high grade, and supplementary to rather than competitive with the products of the domestic factories.

TABLE 145.—Lace window curtains not specially provided for (not made on the Nottingham lace-curtain machine); Imports for consumption—value, 1912–33

Fiscal year (unless otherwise stated)	Quantity	Value	Duty collected	Value per unit	Average ad valorem rate
	Square yards				Percent
1912		\$592,724	\$355,635		60.00
1913		559,610	335,766		60.00
1914 (July 1–Oct. 3, 1913)		158,212	94,927		60.00
1914 (Oct. 4, 1913–June 30, 1914)		449,656	269,794		60.00
1915		487,322	292,393		60.00
1916		393,338	236,003		60.00
1917		473,988	284,393		60.00
1918		227,360	136,416		60.00
1918 (July 1–Dec. 31)	93,980	49,857	29,914	\$0.531	60.00
1919 (calendar year)	218,489	145,063	87,038	.664	60.00
1920 (calendar year)	1,001,631	912,022	547,214	.911	60.00
1921 (calendar year)	767,417	538,711	326,324	.702	60.57
1922 (Jan. 1–Sept. 21)	1,374,149	636,616	387,175	.463	60.82
1922 (Sept. 22–Dec. 31)	197,583	92,431	83,188	.468	90.00
1923 (calendar year)	1,454,644	589,268	530,341	.405	90.00
1924 (calendar year)	1,008,864	411,507	370,356	.408	90.00
1925 (calendar year)	1,032,980	379,189	341,270	.367	90.00
1926 (calendar year)	1,129,090	411,312	370,181	.364	90.00
1927 (calendar year)	1,995,611	592,081	532,873	.297	90.00
1928 (calendar year)	1,696,568	486,115	437,323	.287	89.96
1929 (calendar year)	923,113	266,185	239,566	.288	90.00
1930 (Jan. 1–June 17)	323,364	91,249	82,124	.282	90.00
1930 (June 18–Dec. 31)		169,114	152,203		90.00
1931 (calendar year)		200,100	179,640		89.07
1932 (calendar year)		206,746	186,161		90.00
1933 (calendar year)		147,537	131,957		89.44

(b) *General imports.*—General imports of lace window curtains, which are classified according to country of origin, are grouped with Nottingham lace window curtains. However, as there are no Nottingham lace-curtain machines in Switzerland, it is known that practically all the imports attributed to Switzerland are Swiss embroidered curtains. Table 146 shows imports of lace window curtains of all kinds from 1912 to 1933.

TABLE 146.—Lace window curtains of all kinds: General imports, 1912–33

Year	Switzerland	All other	Total	Switzerland
				Percent of total
<i>Fiscal</i>				
1912	\$310,537	\$527,222	\$837,759	37.07
1913	344,241	375,430	719,671	47.83
1914	389,169	368,220	757,389	51.72
1915	329,605	263,807	593,412	55.54
1916	322,501	127,347	449,848	71.69
1917	352,855	138,592	491,447	71.80
1918	177,470	68,443	245,913	72.17
1918 (July 1–Dec. 31)	15,347	52,003	67,350	22.79
<i>Calendar</i>				
1919	123,431	71,089	194,520	63.45
1920	877,194	220,709	1,097,903	79.90
1921	456,464	111,010	567,474	80.44
1922	641,386	126,400	767,786	83.54
1923	552,130	170,748	722,878	76.38
1924	328,362	189,534	517,896	63.40
1925	327,115	145,899	473,014	69.16
1926	306,984	193,502	500,486	61.34
1927	516,874	150,690	667,564	77.43
1928	407,674	107,337	515,011	79.16
1929	213,562	73,226	286,788	74.47
1930	212,870	60,050	272,920	78.00
1931	172,740	41,059	213,799	80.80
1932	200,021	40,586	240,607	83.13
1933	140,698	211,885	352,583	39.90

Imports reached a peak in 1920 and thereafter declined to a low in 1931; during this period imports were mainly Swiss embroidered curtains, and these were subject to increasing competition from domestic woven curtains. In 1933 imports of Swiss embroidered curtains fell to 40 percent of the total general imports of lace window curtains. The increase in the total imports in that year was largely due to the introduction from abroad of upholstery articles in imitation of Belgian hand-made lace articles made on the Nottingham lace curtain machine.

4. Cost data concerning Swiss embroidered curtains

Through the Ostschweizerischer Kettenstich-Industrie Verband, the Tariff Commission in 1924 obtained from seven manufacturers 32 verified costs of curtains of all styles. The designs ranged from the simplest to the most elaborate, but only four of the simplest designs could be matched with the products of the domestic industry. The variable factors inherent in the articles themselves—style, quality of net, yarn counts used, hand work, and weight of a unit—rendered identical comparisons impossible, but the comparisons made were on articles which were like or similar and competitive. Differences in size were eliminated as a factor by the reduction of all costs to the basis of the square yard.

TABLE 147.—*Swiss embroidered curtains: Comparison of costs of production per square yard in the United States and Switzerland, plus transportation and other landing charges to New York, in 1924*

	Five articles, domestic	Four articles, foreign	Percentage of cost		Ratio of domestic costs to foreign costs taken as 100
			Domestic	Foreign	
Costs:					
Material.....	\$0.2724	\$0.1638	35.77	49.98	166
Manufacturing labor.....	.3468	.1156	45.53	35.28	300
Manufacturing expense.....	.1424	.0483	18.70	14.74	195
Total cost at plant.....	.7616	.3277	100.00	100.00	232
Transportation and charges to New York.....	.0019	.0169			11
Total cost delivered at New York.....	.7635	.3446			222

5. Importers of Swiss embroidered curtains and the mark-up

Swiss embroidered curtains are imported and sold wholesale by 4 or 5 merchants in New York. Three of these importing agencies are the selling agencies of three large Swiss producers; the fourth is a large domestic manufacturer of Nottingham lace curtains who imports Swiss curtains and sells them as supplementary to his main line of merchandise. Swiss embroidered curtains are also imported and retailed by department stores. The sale of these curtains is to a certain extent controlled by fashion, demand depending partly upon decorative fashion at any given time and upon the appeal of the pattern. Although there is very little direct competition between imported Swiss curtains and domestic Swiss curtains there is some competition between Swiss curtains and domestic Nottingham lace curtains. Prices of Swiss curtains vary widely with the size of the curtain, the quality of the net, and the amount of work involved in producing the pattern; unless illustrated by patterns, prices mean very little. The importer's mark-up, the percentage added by the importer to the landed cost to obtain the selling price, on imported Swiss curtains was ascertained by the Tariff Commission in 1931 and 1932; 54.66 percent (\$534,405) of total imports during the fiscal years 1928-29 were investigated. This study disclosed a mark-up ranging from 76.42 percent on elaborate panels embroidered in colors to 21.16 percent on simple Irish Point curtains sold by the pair. In every instance the mark-up was higher on panels than on pairs of curtains. The articles imported and sold by company number 1 were very elaborate and of a high quality, and although sales were limited, profits were high. The following table shows the mark-up for three importers:

TABLE 148.—*Swiss embroidered curtains: The importer's mark-up*

Company	Curtains	Panels	Average
	Percent	Percent	Percent
1.....	31.55	76.42	50.69
2.....	21.16	31.21	22.50
3.....	26.79	28.00	27.50
Weighted average.....	26.51	34.38	30.57

III. BRAIDS

1. Production and imports for consumption

Census returns record production of cotton braids from the year 1919 to 1931, as shown in table 149. Imports for consumption are shown in table 150.

TABLE 149.—*Braids: Value of domestic production, 1919-31*

Year	Cotton small wares (braided)	Silk braids and bindings	Artificial or imitation horsehair braids	Year	Cotton small wares (braided)	Silk braids and bindings	Artificial or imitation horsehair braids
1919.....	\$17,431,154	\$13,218,284		1927.....	\$12,117,760	\$11,284,678	
1921.....	13,025,750	15,879,046		1929.....	21,125,539	4,862,521	\$1,284,856
1923.....	15,064,245	17,555,885		1931.....	13,068,141	2,583,657	864,644
1925.....	13,079,928	14,512,719					

TABLE 150.—*Braids, loom-woven and ornamented in weaving, or made by hand or on braid, knitting, or lace machines: Imports for consumption—Value, 1925-33*

Year	Cotton	Flax, etc.	Silk	Rayon ¹	Metal threads	Total
1925.....	\$431,508	\$18,352	\$64,065	\$1,113,137	\$10,369	\$1,637,431
1926.....	704,843	23,288	45,328	1,041,131	23,893	1,838,483
1927.....	326,709	3,168	52,174	585,274	19,436	996,761
1928.....	135,070	615	42,861	588,245	29,621	796,415
1929.....	154,305	4,374	30,536	594,927	11,138	595,230
1930 (Jan. 1-June 17).....	134,622	231	9,244	330,024	2,197	476,318
1930 (June 18-Dec. 31).....	11,949		1,657	75,005	1,765	90,376
1931.....	47,134		981	287,317	6,385	341,517
1932.....	4,218		298	35,662	1,416	41,594
1933.....	2,858		152	34,908	2,647	40,565

¹ Includes imports made of artificial silk, artificial horsehair, visca, and cellophane.

Imports of cotton braids are chiefly from Germany and Czechoslovakia, and rayon braids are chiefly from Switzerland.

2. The mark-up on imported braids

The Tariff Commission in 1931 and 1932 obtained the mark-up, the percentage added by the importer to the landed cost to obtain the selling price, on imported braids valued at \$697,666, or 49.13 percent, of total imports during the 2 fiscal years July 1, 1927 to June 30, 1929. The mark-up ranged from 13.81 percent to 37.18 percent, with a weighted average of 21.65 percent. The mark-up of three importers of cotton braids averaged 13.81, 29.13, and 37.18 percent, respectively. The mark-up on rayon braids for women's hats for the three importers averaged 18.92, 20.91, and 22.30 percent, respectively.

IV. ORNAMENTS AND TRIMMINGS N.S.P.F., FRINGES, AND GIMPS

Fringes are trimmings, straight or indented on one edge, with ends, sometimes knotted by hand, hanging down on the other. Gimps are woven or braided narrow fabrics used for upholstery trimming. "Ornaments" and "trimmings" include a wide range of articles, such as silk velvet pillow covers, ornamental banners, metal gallions for trimming military uniforms, and rosebud, flower, and leaf trimmings, being artificial flowers, etc., superimposed upon narrow ribbon.

It is impossible to compare imports of articles in this classification with domestic production, because of the wide range and variety of the articles included therein. Tables 151 and 152, however, show domestic production and imports for consumption, respectively, of fringes, gimps, ornaments, and trimmings. These are imported largely by department stores. Imports are supplied by France, Germany, Italy, and Czechoslovakia.

TABLE 151.—Value of domestic production of fringes, gimps, and similar ornaments and trimmings, census years 1899–1931

Census year	Silk fringes and gimps	Silk military trimmings	Braids, trimmings, fringes, etc.	Regalia badges, and emblems
1899	\$444,787	\$54,666	(1)	\$3,049,481
1904	1,016,954	170,231	(1)	4,753,206
1909	824,527	346,963	(1)	6,129,040
1914	1,025,188	431,422	\$7,810,105	5,025,451
1919	3,026,560	682,909	(1)	9,305,470
1923	6,913,276	(1)	(1)	10,359,349
1925	10,278,520	(1)	(1)	10,585,846
1927	6,794,095	(1)	7,852,896	9,623,018
1929	7,507,643	(1)	(1)	7,691,253
1931	7,838,964	2 2,464,918	(1)	7,927,214
	4,074,631	2 2,061,554	(1)	(1)

¹ Data not available.

² Millinery trimmings.

TABLE 152.—Ornaments, trimmings, n.s.p.f., fringes, and gimps:¹ Imports for consumption—Value, 1918–33

Year	Cotton	Flax, etc.	Silk ²	Rayon	Total
1918 (July 1–Dec. 31)	\$4,436	\$8	\$62,575		\$67,069
1919	95,919		147,556		243,475
1920	111,142	1,792	383,665		496,599
1921	108,030	3,257	316,757		428,044
1922 (Jan. 1–Sept. 21)	43,855	3,674	338,228		385,757
1922 (Sept. 22–Dec. 31)	55,222	7,910	229,554		292,686
1923	713,551	12,351	907,270		1,633,172
1924	718,593	4,517	830,570		1,553,680
1925	383,091	4,723	502,443		890,257
1926	615,777	11,848	574,071		1,201,696
1927	522,783	251,814	491,348		1,265,945
1928	175,336	515,691	301,844		992,921
1929	135,119	312,868	283,883		733,870
1930 (Jan. 1–June 17)	31,753	75,469	71,651		178,873
1930 (June 18–Dec. 31)	40,113	9,382	78,770	\$44,559	172,824
1931	79,057	1,223	62,627	49,111	192,018
1932	51,477	14	33,335	82,064	166,890
1933	17,590	75	28,203	92,200	138,068

¹ Not separately recorded prior to July 1, 1918.

² Prior to the act of 1930, includes only ornaments and trimmings, n.s.p.f.

³ Imports shown for act of 1922 include also "fringes and gimps" which were separately recorded in Commerce and Navigation.

⁴ Not separately recorded prior to the act of 1930.

Imports for consumption of "artificial flowers of lace" were recorded for the years 1923–25; the classification was changed in 1926 to "Artificial flowers of yarns, threads, or filaments." Imports were large, amounting to \$2,380,697 in value in 1927, the peak year.

Imports of beaded fringes, ornaments, and trimmings are dutiable under 1529 (a) of the Tariff Act of 1930 and amounted to \$68,955 in value from June 18 to December 31, 1930. In 1933 the value of imports had shrunk to \$12,149.

Domestic exports of ribbons, braids, fringes, and narrow trimmings of rayon were first separately recorded in 1928. These exports were

valued as follows: 1928, \$113,732; 1929, \$106,518; 1930, \$111,539; 1931, \$77,829; 1932, \$51,737; and 1933, \$66,331. The principal markets for these articles in the order of their importance were Canada, the Philippine Islands, and Cuba.

The weighted average mark-up on these articles in 1928 and 1929 was as follows: Ornaments, 87.68 percent; trimmings, 103.25 percent; fringes, 63.10 percent; and gimps, 70.04 percent. The weighted average for the total was 67.11 percent.

V. FLUTINGS, QUILLINGS, NECK RUFFLINGS, AND RUCHINGS

Mention has been made of quillings, narrow insertions of bobbinet of various materials, made on bobbinet machines. They are made in various widths from half an inch to 5 inches. Most wholesale merchants of lace include quillings in their stock, even if they do not handle nets and nettings. One lace firm from which the Tariff Commission obtained data during the valuation study carried 33 different items of quillings varying in width, gage of machine, quality, color, and material and a second firm carried 16. Usually, however, the bulk of the business is transacted in 3 or 4 widths. The mark-up, the percentage added by importers to the landed cost to obtain selling price, was relatively high and ranged from 23.13 percent, the mark-up of a large firm having a bulk trade, to 99.87 percent, the mark-up of a firm carrying but few numbers as part of a high-grade general lace business. The average mark-up of 6 firms was 37.09 percent.

There is no domestic production of quillings made on the bobbinet machine, but a few imitations are made on the Levers lace machine. Imports are mainly from England; small quantities come from France. Table 153 shows imports for consumption, 1918–33, of quillings, flutings, neck rufflings, and ruchings. Inasmuch as imports of the last three items are negligible, the figures represent chiefly imports of quillings.

TABLE 153.—Flutings, quillings, neck rufflings, and ruchings: Imports for consumption, 1918–33

Year	Cotton	Flax, etc.	Silk	Rayon	Total
1918 (July 1–Dec. 31)	\$615		\$7		\$622
1919	2,530		238		2,768
1920	3,456		240		3,696
1921	7,576		2,646		10,222
1922 (Jan. 1–Sept. 21)	14,688		1,459		16,147
1922 (Sept. 22–Dec. 31)	535		543		1,078
1923	6,402	\$267	1,693		8,362
1924	2,326		934		3,260
1925	913	71	364		1,348
1926	3,220		1,423		4,643
1927	4,542		379		5,113
1928	12,372		227		12,599
1929	5,484		562		6,148
1930 (Jan. 1–June 17)	762		216		978
1930 (June 18–Dec. 31)	7,371			1 \$622	7,993
1931	23,544		132,573	12,042	58,159
1932	7,521		19,003	13,837	20,361
1933	16,886				16,886

¹ Includes flouncings, all-overs, and tuckings.

VI. WEARING APPAREL, WHOLLY OR IN PART OF LACE

The term "wearing apparel, wholly or in part of lace" includes chiefly articles of feminine attire, such as hats, shawls, dresses, skirts, undersuits, sleeping garments, bandeaux, chemises, slips, stockings, and neckwear. The last item comprises collar and cuff sets of Belgian Princess, guipure, Bohemian, Lyons Alençon, German embroidered, and appliqué laces. Data for comparable domestic production are not available.

Imports of wearing apparel, wholly or in part of lace, separately recorded since September 21, 1922, are shown in table 154. Table 155 shows general imports, classified by countries, of wearing apparel of cotton or silk, wholly or in part of lace or embroidery.

TABLE 154.—*Wearing apparel made wholly or in part of lace: Imports for consumption, 1922-33*

Year	Cotton ¹	Flax, etc. ¹	Silk (not knit)	Total
1922 (Sept. 22-Dec. 31).....	\$65,542	\$15,250	\$112,348	\$193,140
1923.....	389,092	32,753	679,590	1,101,435
1924.....	435,925	37,154	776,272	1,249,351
1925.....	384,971	33,117	916,923	1,335,011
1926.....	190,932	22,717	881,517	1,095,166
1927.....	168,344	17,804	598,791	782,939
1928.....	195,245	21,350	688,236	905,831
1929.....	238,281	18,792	701,414	958,487
1930 (Jan. 1-June 17).....	66,079	5,170	228,418	299,667
1930 (June 18-Dec. 31).....	(²)	(²)	246,584	246,584
1931.....	(²)	(²)	170,286	170,286
1932.....	(²)	(²)	54,589	54,589
1933.....	10,900	699	35,301	46,900

¹ Includes corsets wholly or in part of lace.² Included with embroidered wearing apparel.

The large department stores and specialty shops are the principal importers of these items; a considerable portion is also brought into the country by returning tourists as personal effects, and another class of importer is the theatrical producer.

TABLE 155.—*Wearing apparel of cotton or silk, wholly or in part of lace or embroidery: General imports, by countries, 1922-33*

Year	Cotton				Silk					Total
	France	Germany	All other	Total	France	Belgium	Japan	China	All other	
1922 ¹	\$107,040	\$183,109	\$111,756	\$401,905	\$520,855	\$17,695	\$119,124	\$9,054	\$101,890	\$768,618
1923.....	469,358	4,070,153	621,408	5,160,919	2,947,722	26,257	327,648	52,610	272,895	3,627,132
1924.....	871,923	296,398	527,871	1,696,197	4,312,392	28,050	332,681	153,355	284,899	5,111,377
1925.....	511,933	200,815	324,950	1,037,698	3,084,159	60,140	254,487	102,004	245,814	3,746,604
1926.....	325,917	96,517	203,223	625,657	3,364,595	72,439	297,801	134,795	322,767	4,192,397
1927.....	381,886	95,956	239,157	716,999	3,481,965	114,220	262,620	79,105	376,129	4,314,039
1928.....	325,833	155,967	268,489	750,289	2,801,857	95,034	230,874	115,516	270,541	3,513,822
1929.....	384,828	120,079	307,888	812,795	2,781,220	114,424	162,191	151,023	251,144	3,460,002
1930.....	292,994	118,925	194,539	606,458	1,876,721	39,741	77,299	126,988	150,928	2,271,677
1931.....	124,017	95,611	116,228	335,856	842,221	7,545	59,543	146,259	72,078	1,127,646
1932.....	45,871	50,262	68,545	164,678	241,454	307	35,457	83,404	20,375	380,997
1933.....	58,424	3,910	47,307	109,641	188,407	833	79,545	65,455	15,327	349,567
Total.....	3,893,029	5,487,702	3,931,361	12,412,092	25,443,568	576,685	2,239,270	1,219,568	2,384,777	32,863,878
Percent of total.....	31.39	44.19	24.42	100.00	80.46	1.75	6.81	3.71	7.27	100.00

¹ Sept. 22 to Dec. 31.

Invoice prices on 59 imported dresses wholly or in part of lace were obtained during the Tariff Commission's valuation study made in 1931 and 1932 covering the period July 1, 1927 to June 30, 1929; these prices ranged from \$30.23 to \$132.17. Three of the dresses were priced at less than \$50 each; 33 were priced between \$50 and \$75; 15, between \$75 and \$100; and 8, over \$100. The weighted average mark-up, the percentage added by importers to the landed cost to obtain the selling price, on these dresses was 72.03 percent.

Invoice prices on 34 pieces of underwear ranged from \$3 to \$17.10; of these, 3 were priced at not exceeding \$5; 5 at not exceeding \$7.50; 10 at not exceeding \$10; and 16 at over \$10 each. The articles in the first-mentioned range were bandeaux; in the second and third, chemises, bloomers, and combinations; and in the fourth, slips and nightgowns. The average mark-up on the whole was 55.26 percent.

Neckwear consists of yokes and collar-and-cuff sets of two kinds, Belgian hand-made lace of the styles called Princess and appliqué on net, and machine-made laces, comprising articles made of Lyons Alençon lace, and of schiffli lace (dutiable at 90 percent). Yokes of Lyons Alençon lace so nearly approximate in price the same articles of Belgian hand-made lace that they are combined for the purposes mentioned. Prices of these ranged from 60 cents to \$2 each. The lower price is that quoted for a cheap collar of Belgian hand-made Princess lace, and the higher price for a Lyons Alençon yoke. Six of the twelve articles constituting the range from which these prices are quoted were priced at less than \$1, and six were priced above \$1 each.

Neckwear of schiffli lace is imported in large quantities. Price data were obtained on 111 pieces. These were, in the main, cheaper than the lace articles discussed and are quoted per dozen, the prices ranging from \$1.70 to \$29.61 per dozen. Twenty of these were priced at not more than \$2.50 per dozen; 23 between \$2.50 and \$5; 31 between \$5 and \$7.50; 18 between \$7.50 and \$15; and 19 over \$15 per dozen. Prices for lace collars ranged from 15 cents to \$2.50 each. The mark-up on schiffli neckwear was 53.28 percent, and the average for the total of neckwear was 53.54 percent. The total imports of wearing apparel of the five wholesale firms whose data are considered were valued at \$407,105 or 22.59 percent of the total, \$1,801,789, imported into the United States in the fiscal years 1928 and 1929.

VII. "LACES MADE ON A KNITTING MACHINE"

Real lace is made by hand by two processes, the needle (point lace), and the bobbin. To these basic types must be added two styles of Irish lace, Carrick-ma-crosse and Limerick, crochet work, and the style known as "mi-manuelle" in Belgium. Hand-made lace was known as "lace" in England; as "dentelle", in France; and by various names, according to the languages, in other countries.

Towards the end of the eighteenth century and early in the nineteenth, experiments were made to produce fancy meshes and patterns on knitting machines. These led to intense research and to the invention of machines which resulted in the production of machine-made laces, which although imitations of lace as then recognized, are today accepted commercially and legally as lace. Some of the machines known as lace machines are the bobbinet machine, the bobbinet-Jacquard machine (used for making Lyons Alençon laces), the Levers and Levers go-through lace machine, and the Nottingham lace-curtain

machine. Other types of machines also produce what are commercially known as laces. (1) An article which is termed lace is made by embroidering patterns in chain-stitch on net with a Bonnaz or Cornely machine, which is a variation of the sewing machine. (2) Another type, known technically as burnt-out lace, is the product of the schiffli embroidery machine. It is taken from the machine as an embroidered fabric and does not become lace until the cloth foundation has been destroyed by heat or dissolved by a mordant bath. (3) Another type is made on a special braiding machine with Jacquard attachment. This machine is referred to in paragraph 372, of the Tariff Act of 1930, as a lace-braiding machine, and the product (sometimes termed fancy braid) is called Barmen lace. Other types made on special braiding machines are called two-thread or three-thread lace. It will be seen, therefore, that lace, known as such by name and commercially, is not of necessity made upon a lace machine. It is repeated that the first attempts to produce fancy meshes and patterns were made on knitting machines. Some products of warp-knitting machines are competitive with some products of lace machines in the domestic industry. They have been covered in past tariff acts by the rather unsatisfactory definition "imitation laces", a term formerly applied to machine-made laces generally.

CHAPTER VIII

THE EVOLUTION OF HAND-MADE LACE

I. EARLY LACES AND LACEMAKING

1. Introduction

The English word "lace" is derived from a series of words of similar sound and spelling in other languages all of which mean "noose" and had their origin in the Latin words "laqueus", or "lacinia", signifying the guard hem or fringe of a garment. The word "lace" in the principal European languages is rendered as follows: Italian, "merletto, trina"; French, "dentelle"; German, "spitzen"; Dutch, "kanten"; Spanish, "encaje"; Swedish, "spets"; Russian, "kroogeva." The Chinese word for lace differs with the dialect, but in the producing centers, Swatow and the vicinity, the word used is "si pi."

Possibly the earliest use of the word "lace" is to be found in an ancient rule for English nuns, which dates from 1210. It developed its meaning as applied to decorative openwork in the sixteenth century, before which period the word was used in conjunction with another word of a qualifying nature—shoe lace, corset-waist lace, sleeve lace, and it was also applied to the fancy braids or ties used in trimming clothing. A passage in *Much Ado about Nothing* indicates that in Shakespeare's time the word "lace" was generally used as a verb denoting "to decorate with trimming." Gold and silver passementerie were freely referred to as lace, but passements and laces were given distinctive names about 1650.

Hand-made lace is called real lace in order to distinguish it from the machine-made article which was formerly called imitation lace. Samuel L. Goldenberg compares the two types as follows:

Notwithstanding the marvelous results attained in machine-made lace, they are the triumphs of mechanisms which cannot displace the superiority, charm, and rarity of the finest handmade work. In the latter the personal equation of the skill and the living workmanlike fidelity of the individual toiler to his task impart a quality which dead mechanism can neither create nor supersede. Machine-made lace may be predominantly the lace of commerce but hand-made lace is the natural expression and embodiment of a delicate and difficult art and this it will ever remain.

2. Early evidences of lacemaking

Evidently the origin of lace antedates recorded history. It has been said that the toothed or serrated edges of leaves furnished the inspiration for the first production of lace; the French word for lace, "dentelle", derived from the word "dent", meaning tooth, is supporting evidence of this theory. It is more probable, however, that the knitting and twisting of threads of the frayed edges of garments produced a fringe which was the genesis of lace.

There are biblical references to the making of "nets of checker work" and mention of nets is made by Homer, but the earliest existing specimens have been found in Egypt and Peru. The tombs of

Thebes and other parts of Egypt have furnished specimens of ornamental meshes which date from 2500 B.C., and specimens of net and lace which archeologists hold to predate the Christian era have been found in Peru in the south littoral and in the southern archeological belt at Nasca. The designs of these Peruvian laces consisted of diagonal serrated stripes with fretted key devices, stepped effects, and chevrons, crosses, roundels, squares, lozenges, and representations of the condor, puma, duck, and fish. These laces are made of vicuna, wool, and fibers of the maguey, a species of cactus plant. The wool fiber is colored and in some cases several colors are combined in the same pattern. The meshes, supposed to have been made with a shuttle, are the same as those known today as filet and English antique.

In the Cluny Museum in Paris there is a piece of Coptic lace which was made between the third and seventh centuries A.D. It is a bobbin lace resembling Cluny; the bobbins were found with the specimen. The fancy needlework and weaving of Copts during this period includes nets, picot edges, drawnwork, and twisted lace; the patterns consisted largely of geometrical shapes, and the materials were flax and wool, the latter in various colors.

Specimens of trimmings, described as lace, have been found in tombs of the early centuries of the Christian era, but there does not appear to be any evidence of systematic production. The paintings of Giotto, 1276 to 1337, indicate the ecclesiastical use of lace at the commencement of the fourteenth century, but it is probable that the amount of lace used by priests was small. An illuminated Harleian manuscript of 1471 gives elaborate instructions for making various braids: "Lace Bascom, lace indented, lace bordered, lace covert, a brode lace, a round lace, a thynne iace, an open lace, lace for hattys", etc., and the initial letter shows a girl performing these tasks. In the municipal archives of Ferrara, under the date of 1469, there is an allusion to lace and an Italian inventory of the Sforza, dated 1493, refers to bone and bobbin lace, and the word "trina" occurs constantly. A picture in the Church of St. Gomas at Lierre, which was painted not later than 1525, shows a girl making lace, and an engraving of 1551 shows a girl with pillow and bobbins.

3. Pre-Renaissance laces

During the immediate pre-Renaissance period in Europe the greatest developments in lacemaking appear to have been made in the Byzantine Empire and the islands of the Grecian Archipelago, and it is from these sources, according to general belief and acceptance, that lace was introduced into Venice. The reciprocal maritime and mercantile influence of Venice, Greece, and the East explains the establishment of the work in Venice. Spanish tradition ascribes the origin of Spanish lace to the Moors and Saracens; one pattern, "El Sol", is to be found in early Spanish textiles and in Moroccan work. The early laces of Ragusa, in Dalmatia, which were evidently introduced from the Byzantine Empire, were distinctly Byzantine in style, with the knotted stitch known as Punto Avoria, Punto Saraceno, and Point Nouée. These pre-Renaissance laces, however, consisted of drawnwork, cutwork, darned work, and macramé, the first three of which required a preexistent fabric.

Drawnwork (punto tirato) was made by removing threads from a fabric and tying the remaining threads to produce a pattern, or intro-

ducing other threads for that purpose. It was sometimes drawnwork only, or, in addition, it might be embroidered, or embellished with colored threads. Cutwork (punto tagliato, point coupé) was made by cutting away portions of a fabric and oversewing the edges with buttonhole stitches and filling in the spaces with needlepoint lace, which was made by stretching threads diagonally in the space where the cloth was cut away to support motifs made in the buttonhole stitch; brides and picots were introduced, and simple geometrical outlines were followed. In addition, cutwork was occasionally embroidered. Darned work (punto a maglia quadra laxis) had two species of square network for a basis—knotted, and buratto, which is woven and in which the warp threads are twisted at each passage of the weft threads, as in leno netting at the present time. The pattern was inserted in darned work independently of the making of the basic fabric, and consisted largely of medieval subjects, animals, and figures. The style is revived as filet Italien. The pattern was sometimes made from colored threads. Macramé¹ (punto a groppo, or gropari) was made by twisting or knotting warp threads left unwoven at the ends of a piece of cloth, the upper part of the pattern into designs and the ends hanging down either as fringe or groups of tassels.

4. The rise of the art in Europe

With the fabrics, introduced into the Venetian Empire from the East, as a foundation, the Venetians began to develop lace as it is known today. Reticella, Gothic, or Greek lace was the first adaptation to be developed; this fabric was so called because the pattern was based on repeated squares or reticulation of stiff geometrical openwork, and is sometimes designated "needlework-guipure"; guipure, however, is a term of variable designation, and is so extensively applied, for instance, to Venetian, Honiton, and Maltese laces that it is difficult to place a limit to the meaning. The square spaces of Reticella were cut from a woven fabric and any threads remaining were fastened together by the buttonhole stitch and rigid geometrical designs were introduced. This early Renaissance lace was sometimes inserted in pieces of laxis. Reticella was first mentioned in the Sforza inventory of 1493.

Lacemaking as it is known today implies a simultaneous production of pattern and fabric and based on no preexistent fabric. The Venetians abandoned the foundation fabrics about the year 1530 and relied upon the needle. Thus their first real lace was the fine needlepoint lace which we know today as Punto in Aria, and the design took floral forms and was independent of squares or reticulations. Curiously enough, almost simultaneously the art of lacemaking commenced in Flanders by an entirely different process—the pillow, bobbins, and pins. As matter of fact, Flanders hotly contests Italy's claim of priority even in the manufacture of needlepoint lace as much as she disputes Italy's claim to priority in the art of writing madrigals, but the appearance of pattern books in Venice in 1560 tends to establish its origin in Italy, as similar books did not appear in Flanders until the end of the century.²

¹ The Arabic designation of fringe.

² Upon the point of the simultaneous invention of the art of lace making, A. S. Cole, an acknowledged authority upon the subject, writes as follows:

"It is remarkable that lacemaking should have sprung up or been invented at about the same period of time by two entirely different processes, without relationship or evolution between them, and the people of the countries, wherein either of the inventions was made, were not only unknown to each other, but apparently neither had any knowledge of the processes of lacemaking employed in the other country." It is also remarkable that the two countries of Europe, Italy and Flanders, where pictorial art first attained distinction, were also the countries where lacemaking first became an industry of importance.

All early Italian laces were needlepoint, and all early Flemish laces were pillow and bobbin laces. Mixed laces in both countries are of later date: Italy copied pillow lace from Flanders, and Flanders copied needlepoint lace from Italy. From Italy and Flanders the art spread throughout Europe. France copied needlepoint Venetian laces, and Flemish refugees brought the art of pillow and bobbin lace to England. Barbara Uttman started the making of pillow laces in Germany in 1567 and is there credited with its invention, although she learned the art from a Flemish exile. The most wonderful laces were those made with needle or bobbin without any preexistent ground, web, net, or warp, and these types established the work as one of the great decorative arts.

II. THE TWO FUNDAMENTAL SYSTEMS OF HAND LACEMAKING:

1. Needlepoint lace

Needlepoint⁴ lace, allied to embroidery, developed from Punto in Aria, which logically followed the Reticella of the Ionian Isles. The only kind of stitch used was the buttonhole or double-loop stitch, each stitch being finished as the work advanced. The following description of the production of "Point d'Alençon" is condensed from the article on lace in The New International Encyclopedia. The pattern was built up in progressive stages by a series of workers each of whom was an expert in her particular line. The design being drawn, was pricked with a needle on parchment, which was reinforced with a backing of stout linen, and the portions of the design to be worked out by the different dentellières were shown in different colors. Over the lines of the design one or more threads of linen were lightly stitched down to the backing and the slow work of filling up the pattern proceeded on the thread outline so obtained in the following order:

First worker. The tracing of the design on the parchment.

Second worker. The filling in of the coarser groundwork or brides;⁵ color yellow.

Third worker. The filling in of the réseau; color green.

Fourth worker. The rempli or making of the solid buttonhole stitch; color white.

Fifth worker. The filling in of the modes; color red.

Sixth worker. The outlining of the objects with the cordonnet; color black. (The brides and the cordonnet were covered by the buttonhole stitch.)

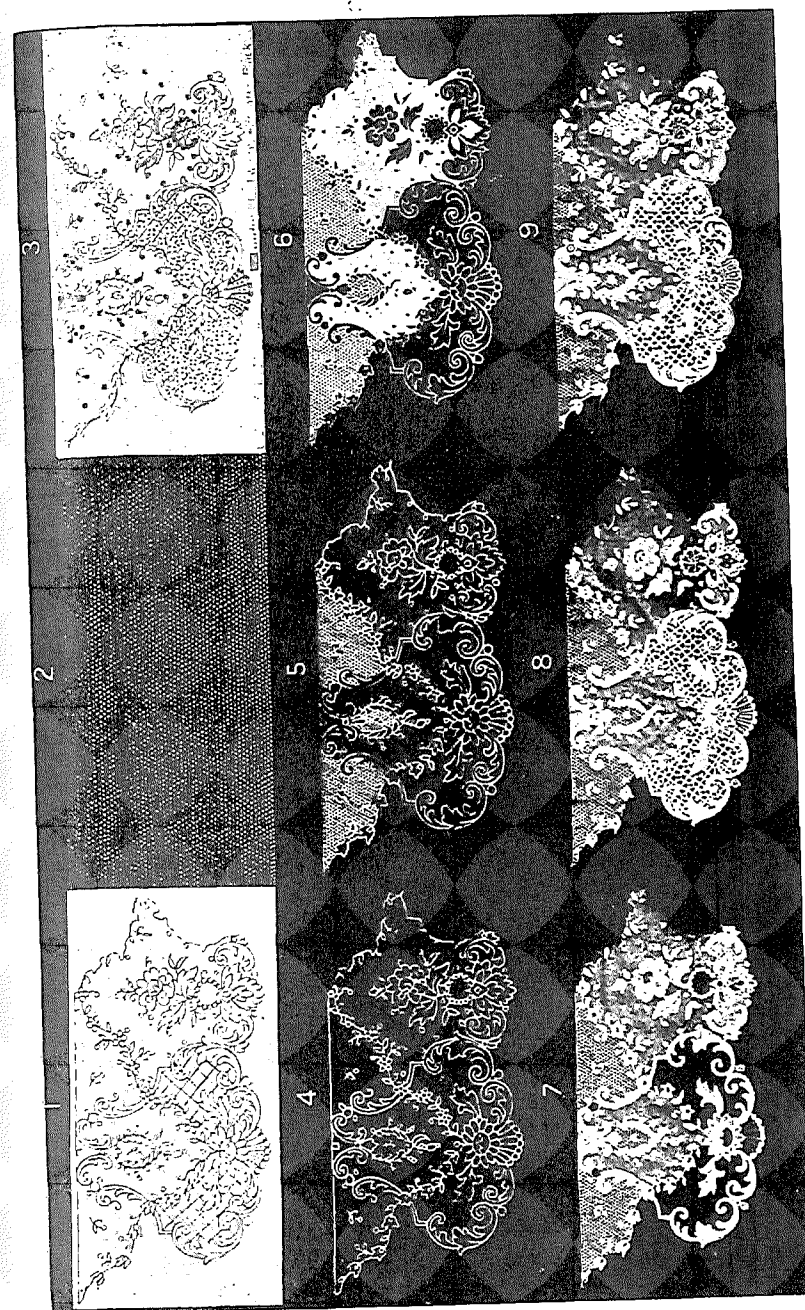
The procedure is the same today, except that the whole of the processes are carried out by the same worker. The whole series of processes is displayed in the section of industrial arts, in the Metropolitan Museum of Art, New York. That exhibit is shown pictorially on page 436 of volume 13 of The New International Encyclopedia, and is here reproduced. When the pattern and fillings were finished, the couching threads, which held the outlining threads to the parchment, and the linen backing were cut, and the finished lace was liberated. The insertions were called "passements", a word also

³ Crochet lace is of a much later date and is allied with the products of the knitting machine; if macramé is to be considered a type of lace, it is a remnant of early knotted work; the remaining type of lace—machine-made—is a development of fancy weaving.

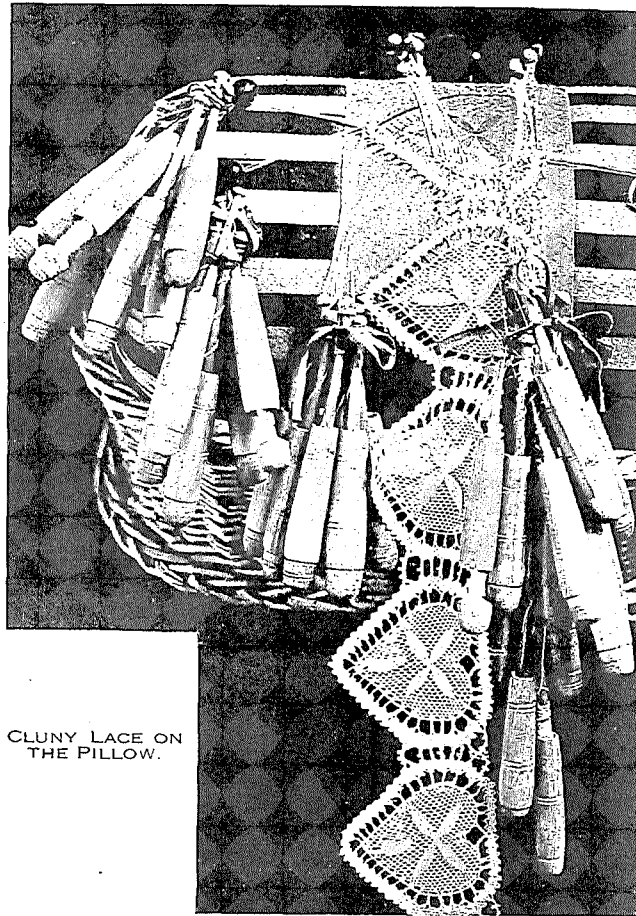
⁴ The word "point" was originally applied to needlepoint, or point d'Aiguille only, but the French word "point" is now applied indifferently to other styles, sometimes with a geographical reference, indicating a place of origin.

⁵ French designers and workers brought the art to a high degree of perfection, and French terms are usually employed in speaking of hand-made lace. The different parts are designated thus: The solid parts of the objects of the pattern, "toile", the links, "brides"; the net, "réseau, fond, jour, treille, champ, engrélure"; the fancy grounds, "modes"; the outlining thread, "cordonnet, brodeur"; the small loops which are worked on the edges of brides or flowers for their enrichment, "picots" (brides when ornamented with picots, "brides ornées"); the heavy threads, "Couronnes"; and the scallop, "dentelé."

PLATE 16



SUCCESSIVE STEPS IN THE MAKING OF POINT D'ALENÇON LACE.



CLUNY LACE ON
THE PILLOW.

PLATE 17

applied to ornamental openwork, and the Vandyked edges were called "dentelles". The conjunction of the *passemment* effect at the top and of the serrated effect at the foot of the breadth gave the same form of lace edge as is used today. It has been said that if lacemaking is an art, the making of needlepoint lace is a fine art.

2. Pillow lace

Pillow, bobbin, and pin laces, derived from an elaboration of plaited fringe work, are built upon no substructure corresponding to the skeleton-thread pattern, such as is used for needlepoint lace, but is the representation of a pattern obtained by crossing, twisting, and plaiting. The geometrical style of pattern was abandoned from the commencement, floral figures were introduced, and the work was, and is, performed by one operator. The pattern is drawn upon paper or parchment and is pricked by the "pattern pricker" who decides where the pins shall be placed to retain the completed twists, and the paper or parchment is fastened to a pillow or cushion. The pillows vary with the countries which use them, and also with the style of lace to be produced. In the *Haute Loire* a pillow which revolves vertically on a cylinder is used for the production of laces of long meterage. The design is fixed and must exactly fit the circumference of the pillow; as the pattern is finished another is commenced without other interference with the work than is occasioned by the ordinary moving of the pins; this repetition can be carried on as many times as desired. For designs with large motifs, such as are required for Valenciennes Brabant, a pillow which revolves horizontally is used; other styles of pillows are used for Chantilly, Duchesse, and Bruges laces. The style of design is different from that used in needlepoint lace, and the designer must know the possibilities of the movements of the threads. The bobbin threads are wound on short cylinders of bone or ivory, hang from the upper part across the pattern, and are plaited, twisted, or crossed over and under each other to form the cloth or the mesh. The pattern is intricate but the bobbins are passed to and fro with rapidity and accuracy, and the pins¹ are withdrawn and replaced as the twisted threads advance along the design. Certain portions of the threads are found to proceed in waving lines from end to end of the piece. These may be called "warp threads." The other threads, lying between those previously mentioned, pass from side to side by an oblique course to the right or the left and may be called "weft threads."

When the objects of the pattern and the ground are made at the same time, the *toile* is composed of threads at right angles, like the threads of woven stuffs, but when the figures are made independently on the pillow and are joined by needle-made brides, the threads follow the shape of the design. The *toile* of needlepoint lace differs in appearance from that of bobbin lace and is easily distinguished from it. On page 33 of the *History of Lace*, Mrs. Palliser states:

The number of bobbins is generally equal to 50 to each square inch. If the lace be 1 inch wide, it will have 625 meshes in each square inch, or 22,500 in a breadth an inch wide and a yard in length.

This process of making lace on the pillow is conducted slowly; on an average about five meshes a minute can be produced when the usual number of twists are given. This may be easily conceived by noticing

¹ Before pins were invented and when they were expensive, fish bones were used for the purpose, whence the term "bone lace."

that each crossing, each twisting of two threads, and the shifting of each pin are so many distinct movements of the hand. The various meshes of net are differently composed, that of Mechlin is hexagonal in shape, 4 of the sides being of double twisted threads and 2 of them being composed of 4 threads plaited together; Brussels net is similar but somewhat larger, and Valenciennes mesh is plaited entirely. All the different varieties of meshes are explained in chapter 18 of *Les Broderies et Dentelles Françaises et Étrangères*, by M. Charles and L. Pagès.⁷ In France bobbin-made lace is called "dentelle à fuseau" and in Italy "merletti a piombini."

3. Development of style

The first needlepoint patterns were derived from drawnwork and cutwork. In the earliest Venetian laces the motifs touched one another without any brides or connecting links but gradually the ornaments were separated and joined by brides. The brides were succeeded by meshes or nets; later, the substantial parts of the pattern were outlined with a single thread, or by a raised edge of buttonhole or plaited work, which was sometimes decorated with small loops or picots; finally some of the ground effects or nets were varied. Radical changes have been influenced by the prevailing fashion of the time or by the national characteristics of the producing workers. The style of one period merged with that of the succeeding period until the new one was recognized as an original departure. The article "Lace" in the eleventh edition of the *Encyclopedia Britannica* classified the development of style and design in the following chronological order:

From about 1540 to 1590 they were composed of geometric forms set within squares, or of crossed and radiating line devices, resulting in a very open fabric, stiff and almost wiry in effect, without brides or réseaux. From 1590 may be dated the introduction into patterns of very conventional floral and even human and animal forms and slender scrolls, rendered in a tape-like texture, held together by brides. To the period from 1620 to 1670 belongs the development of long continuous scroll patterns with réseaux and brides, accompanied in the case of needle-made laces with an elaboration of details, e.g., cordonnet with massings of picots. Much of these laces enriched with fillings or modes was made at this time. From 1650 to 1700 the scroll patterns gave way to arrangements of detached ornamental details; and about 1700 to 1760 more important schemes or designs were made, into which were introduced naturalistic renderings of garlands, flowers, birds, trophies, architectural ornament, and human figures. Grounds composed entirely of varieties of modes, as in the case of the réseau rosacé, were sometimes made then. From 1760 to 1800 small details consisting of bouquets, sprays of flowers, single flowers, leaves, buds, spots, and such like were adopted, and sprinkled over meshed grounds, and the character of the texture was gauzy and filmy. Since that time variants of the foregoing styles of patterns and textures have been used according to the bent of fashion in favor of simple or complex ornamentation, or of stiff, compact, or filmy textures.

Workers in the different countries were not disposed to imitate the first designs but invented new effects and distinct styles. Various districts developed a kind of local patriotism and produced motifs which identified the lace with its place of origin, and distinct styles became identified with certain countries; for example, "gros point de Venice" is identified with Italy, "Mechlin" with Flanders, "heavy blondes" with Spain, "Point D'Alençon and Chantilly" with France,

⁷ The following are books of instruction for bobbin-lace beginners: *The Frisilla Bobbin Lace Book*; *Pillow Lace*, Elizabeth Mincoff and Margaret S. Marriage, 1907; *The Art of Bobbin Lace*, L. and R. Tebbs, 1907; *La Dentelle*, Marguerite de Brievres; *Manuel de Dentelles aux Fuseaux*, Marie H. H. de Jullien; D.M.C. Library *Encyclopedia of Needlework* (translated into all principal languages), Thérèse de Dillmont; *Bibliothek D.M.C. der Klöppelspitzen*, First Series; *Lacis*, Carita, 1909.

and "Honiton" with England. Designs have so varied with the times, and have been so influenced by the prevailing taste at the time of change, that an expert can establish, with a fair degree of accuracy the date of manufacture and the country of origin of most hand-made laces.

Museums are intimate links between art and industry. In those of London, Paris, Berlin, Turin, New York, and elsewhere, the lace exhibits are arranged chronologically so that the stages of development of pattern and texture can be traced.

4. Materials used

Hand-made laces are made, mainly, of three materials—cotton, flax, and silk. Other fibers and substances used in smaller amounts include hemp, jute, ramie, aloe fiber, banana fiber, straw, wool, goat's hair, angora rabbit's hair, human hair, horsehair, rayon, cellophane, metal threads, and string. It is part of the beauty of old Valenciennes laces that they were made of fine Flemish linen—"fynner than any other part of Europe yealdeth"—some of which was spun in damp air, underground, to prevent it breaking. The cordonnet of point d'Alençon, in and after 1690, was of horsehair covered with buttonhole stitches; blonde silk was made of unbleached silk from Nankin, China. In 1805 Samuel Cartledge, of England, introduced fine cotton yarns to the hand-made lace industry of Buckingham and of Northampton. The great bulk of hand-made lace produced since the war is of cotton; this is detrimental to the appearance of the finest grades of Valenciennes and other good-quality hand-made laces, which were formerly made of linen. Metal thread laces were made in Spain and at Aurillac and Arras in France, from the sixteenth to the nineteenth centuries. Cartisane, as originally made in France, consisted of small pieces of vellum or parchment covered with silk or metal threads in a lacelike pattern. Metal thread or tinsel laces were of gold and silver lamé wound around yellow and white cotton yarn, sometimes with an admixture of gray or green silk; the lace ranged in width from half an inch to 12 inches. The collection of metal thread laces in the Metropolitan Museum of Art, New York, contains 46 specimens, all of the eighteenth century; 35 of them are pillow and bobbin laces; they are mostly from France, with a few from Italy, Spain, and Switzerland.

5. Uses of lace

The great extravagance and luxuriousness of clothing during the sixteenth, seventeenth, and part of the eighteenth centuries, created a tremendous popularity and demand for laces which led to the passing of numerous old sumptuary laws. As a convent and cottage industry, lace production attained a high place in Italy, Belgium, France, the Netherlands, Germany, and England; lace was extensively used as an article of personal adornment by both men and women. Felkin sums up the use in the following sentence:

There was no part of the attire of either sex from their heads to their feet which was not ornamented by the addition of lace, often of the richest and most expensive kinds.

Henry II, of France, invented a ruff to hide a scar on his neck and ruffs became a fashion. A similar instance is that of the Cravates or Croate soldiers who had a band of stuff around their throats to support an amulet which they wore as a charm to protect them from

saber cuts. What began in superstition ended in fashion. Steinkirks are lace cravats knotted or twisted in careless fashion in imitation of the way they were hurriedly donned by the French princes of the blood at the battle of Steinkerk. Men wore lace ruffles in the coat, jabots, or neck cloths which hung beneath the chin over the breast, large collars, cravats, sleeves, wristlets or cuffs, and gauntlets; the knee breeches were decorated with rosettes; garters and shoe tops were of lace, and lace even edged the turned-over tops of jack boots. These laces were mainly of needlepoint. Lace is freely mentioned in Elizabethan writings, it was extensively worn in the time of James I, at the period when the ruff was popular, and reached the apex of its use in the reign of Charles II. The portraits of Rubens, Franz Hals, Van Dyke, and Rembrandt bear witness to this. The sturdy patriots of the Colonies, and of the States in the early years of the country, were resplendent in lace and ruffles, Washington himself being foremost amongst them.

Marie de Medici is said to have introduced the lace collar for women, and the women of that time also wore lace sleeves, shawls, lappets, headdresses, caps, scarfs, cuffs, flounces, aprons, skirts, veils, frills, blouses, and jackets. In addition, lace adorned the fan and the handkerchief, the home was decorated with lace, the boudoir, the bed, the dressing table, and even the bath.

Large quantities of the finest lace were also used for ecclesiastical purposes, the trimming of altar cloths, altar frontlets, chalice veils, panels for vestments, for rochets, and aubs.

At the court of Louis XV. each lace had its appropriate season, Alençon and Argentan being the laces of winter. During the French Revolution numbers of the lacemakers went to the guillotine because the products of their art were used by the aristocracy. At the Restoration, under Louis XVIII, a new impetus was given to commercial affairs, and an attempt was made to revive the making of lace by royal patronage. The court sought to revive the ceremonial which had been observed before the Revolution and men at the Tuileries wore ties and wristbands of lace, and it was etiquette for the ladies to wear lace lappets in their hair, of different lengths, as an indication of their rank.

The manner of advertising the latest Parisian modes is thus described by Mrs. Palliser:

The "fameuse poupée" of the reign of Louis XIV must not be forgotten. The custom of dressing up these great dolls originated in the salons of the Hotel Rambouillet, where one termed "la grande Pandore", at each change of fashion was exhibited "en grande tenue"; a second, "la petite Pandore," in morning déshabille.

The laces shown on the "Grande Pandore" were evening dresses, of needlepoint for winter wear, and those shown on the "Petite Pandore" were for morning dresses of pillow-made lace for summer. The dolls were sent to Italy, Vienna, St. Petersburg, Constantinople, and London and were passed "duty free."

III. DEVELOPMENT OF STYLES BY COUNTRIES

1. Italy

The early Italian hand lacemaking centers were Venice, Genoa, Milan, Ragusa, and the island of Burano. The first laces were made entirely by the needle. There are several well-defined styles of Venetian point:

1. Venetian raised point (gros point de Venise or Punto tagliato a fogliami).
2. Venetian rose point with cordonnet.
3. Venetian flat point (plat point de Venise).
4. Mezzo Punto.
5. Coralline, without cordonnet.
6. Venetian grounded point (point de Venise à réseau).
7. Punto di Burano.

The pattern of Venetian raised point had large fantastic flowers issuing from rich scrolls in the Renaissance style. In the early forms of this style, the motifs were not detached but touched one another; later they were connected by brides edged with picots. The motifs were outlined with heavy threads, covered with buttonhole stitches, and fanciful devices were introduced to enrich portions of the pattern so that some of the heavier needle lace resembles bas-relief carving or sculpture in ivory. The interior of the motifs contained beautiful fillings or grounds. Rose point, which dated from 1640, was rich in detail, having smaller motifs with more brides and picots; it was also called point de neige, having groups of picots resembling snow flakes. Venetian flat point was a fine patternless guipure, with no heavy or prominent outlining threads; it is now made with pillow and bobbins. Mezzo punto partakes of the character of Venetian raised point and flat point, the latter part being of the nature of a braid. Coralline or mermaids' lace represents a tangle of seaweed. Venetian grounded point has a net ground and is the most delicate of needlepoint laces. The objects are surrounded by a fine line of delicate stitches, imitated in Lavers bobbin-fining laces by what is known as the ticking. This fine lace was made in very small quantities, sometimes as breadths, sometimes as articles of dress. Punto di Burano, made at the end of the seventeenth century, was inspired by the French Point d'Alençon.

Milan and Genoa were the principal seats for the making of Italian bobbin lace called merletto a piombini. Milan point is the tape lace; the tape is made first on the pillow, and the net or brides are filled in afterward. This lace dates from 1664. There is some production today of point de Milan in which the tape is machine made. Genoa point is of two kinds, a pillow-made tape arranged in spirals and connected by brides and picots, and the same with a pointed scallop. Both of these are made partly with the bobbin and partly with the needle. They are heavy geometrical laces, some of them containing wheat seeds, such as were developed in Maltese laces one or two hundred years later. Gold and silver macramé or knotted laces were also made at Genoa. Other bobbin laces were made in Abruzzi, Sicily, and Venice.

Much of the Italian lace was used for ecclesiastical vestments; it was made in convents, nuns working with the same devotion and care at lacemaking in the sixteenth century as monks gave to their illuminated manuscripts.

2. France

Lace was introduced into France from Italy and Flanders, but its manufacture was comparatively insignificant until the time of Louis XIV when Colbert, his Prime Minister, becoming alarmed at the large sums of money sent abroad for Venetian laces, issued an edict forbidding their importation. This was done with the idea of encouraging the development of the industry in the country. Mrs. Palliser gives a list of the towns in France which were the centers of lace

manufacturing before 1665, the time of the edict. These towns spread over 12 provinces, as follows:

Artois.....	Arras (Pas de Calais).
French Flanders.....	Lille, Valenciennes, Bailleul (Nord).
Normandy.....	Dieppe, Le Havre (Seine Inférieure).
Ile de France.....	Paris and its environs.
Auvergne.....	Aurillac (Cantal).
Velay.....	Le Puy (Haute Loire).
Lorraine.....	Mirecourt (Vosges).
Burgundy.....	Dijon (Côté-d'or).
Champagne.....	Charleville, Sedan (Ardennes).
Lyonnais.....	Lyon (Rhône).
Poitou.....	Loudon (Vienne).
Languedoc.....	Muret (Haute Garonne).

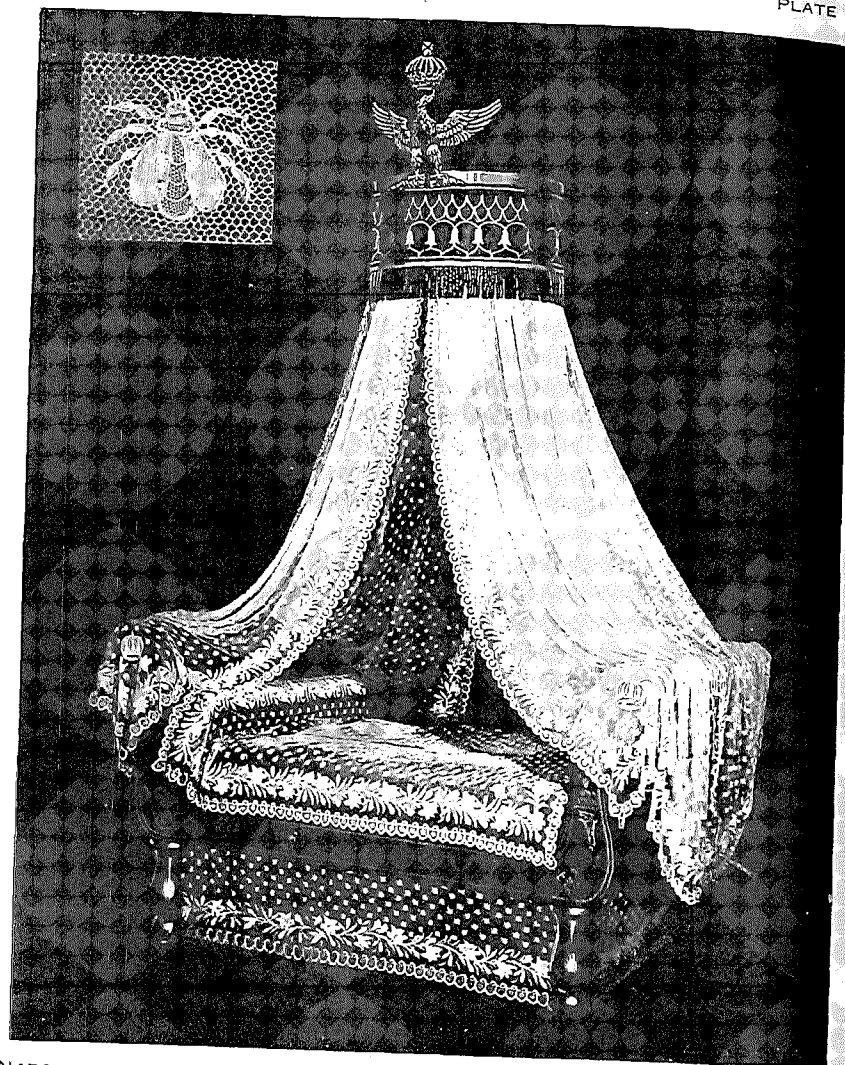
The laces known at the period were as follows: Point (Venetian); Bisette, narrow, coarse pillow lace, made in the environs of Paris; Gueuse, coarse thread pillow lace, called "Beggars' lace"; Campana, white narrow pillow lace; Mignonette, light pillow lace, 2 or 3 inches in width; Point double (also called Point de Paris and Point des champs); Valenciennes; Mechlin (most Flemish laces were then known as Mechlin); gold lace; guipure.

(a) *French needlepoint lace*.—Colbert successfully established lace-making as one of the national industries of France. The best workers of Venice were bribed to come to France,⁸ and they were settled near Alençon, a school for lacemakers was founded, and later the work was extended to Argentan, Sedan, and Auxerre. In 1665 a company was chartered with exclusive privileges for 10 years, subsidized with 30,000 livres, and the importation of Venetian, Flemish, and other laces was forbidden.⁹ The patterns produced were of the Venetian style but of lighter and rococo designs with smaller objects. By Royal decree it was called "Point de France", a name which lasted until 1723. It was made in small pieces sewed together by an invisible seam, known as the assemblage stitch. Mrs. Palliser says the number of processes involved ranged from 10 to 22, varying according to the pattern. The meshes gradually became smaller until they could no longer carry picots; thus the finer réseau of Point d'Alençon was developed; this was in imitation of the pillow net ground of the Low Countries brought to France in 1690. The motifs of the pattern of Point d'Alençon were not raised as in Gros Point de Venise but were finished with a cordonnet of horsehair covered with buttonhole stitch. It appears to have become firmly established about 1700, and the fine looped réseau was a distinguishing feature. It will therefore be seen that both Point de France and Point d'Alençon are intimately connected with Point de Venise; the work, however, was distinguished by its more elaborate pattern. Patterns with larger motifs and larger meshes in the net were called Point d'Argentan. This lace may be distinguished from Point d'Alençon by the retention of the six-sided mesh, covered with fine buttonhole stitches. The brides were adorned with picots, and a fancy mesh used in the lace

⁸ The Venetians replied to this challenge by issuing a decree ordering their lacemakers to return to Venice on pain of their nearest relatives being imprisoned for life. However, this did not prevent large numbers of lace makers from remaining in France.

⁹ The edict which forbade the importation of Venetian laces was the subject of an anonymous political satire, published at Paris in 1661. *Le Révolté des Passements et Broderies*. It is interesting as giving an account of the styles made at the time. The satire, the edict, and the charter establishing the company may be found, written in modern French, in vol. XIV, nos. 1 and 2 of the *Bulletins of the Needle and Bobbin Club of New York*.

PLATE 18



NAPOLEON'S BED TRIMMED WITH ALENÇON LACE. INSET: NAPOLEON'S EMBLEM.
"THE BEE."

was called Argentella or réseau rosacé.¹⁰ Point de Sedan was a needlepoint lace of larger design; these mentioned were the only needlepoint laces made in France, where the art reached its culmination in the reign of Louis XIV.

Opinions differ as to whether Venetian grounded point was an answer to the production of Alençon lace, but the production of the latter probably inspired, directly or indirectly, the fine-meshed Italian lace known as Point Burano.

During the French Revolution, the factory at Alençon was closed, but was reopened by Napoleon I who made compulsory the wearing of Alençon lace at court. This attempt to influence fashion led to such an anachronism as the production of Hamlet with the players wearing cuffs and collars of lace. At the time of Louis XVI the ground of designs was sown with small bouquets, and under the Empire the pattern consisted of flowers, foliage, scrolls, and arabesques, the ground being covered with small buds or dots. Napoleon ordered lace for the Empress, and bees, the Napoleonic emblem, were employed as motifs. Although France borrowed the technique of these laces from Italy, she put the stamp of her own individuality upon them, and brought them to such perfection that they have enjoyed a popularity which has lasted to the present time.

(b) *French pillow and bobbin lace.*—The art commenced at Le Puy with the making of Cluny lace of geometric and antique style, and silk guipure. Flax, silk, wool, goat's hair, and Angora rabbit's hair were used. Le Puy now produces laces of all kinds, including wide flounces of great beauty, in cotton, silk, wool, and metal threads.

Lace was made at Valenciennes as early as the sixteenth century when the town was still part of Flemish Hainault, as it did not become French until the treaty of 1668. This lace, Flemish in origin, French by adoption, is the most beautiful and expensive of French pillow laces, although made by workers who sat in dark cellars from 4 o'clock in the morning until 8 o'clock at night, with only a beam of light concentrated on the pillow, and received but a few cents a day for their labor. So many of them died or became blind that a piece of lace "worked by the same hand" was rare and commanded a relatively high price. The lace was made in one piece, of the same thread, forming a continuous toile and réseau, and there was no cordonnet or outlining thread. The mesh was plaited and strong, diamond shaped, or round. The pattern consisted chiefly of flowers which became conventional; there was generally a scalloped edge, and the réseau was sprinkled with spots or small clubbed objects. The output was small, and the fine and rare varieties evolved but slowly; the plaiting of the threads was firm and compact, in the finest qualities the toile resembling cambric in texture.

This lace, made in the town of Valenciennes, was called Vraie Valenciennes. A somewhat poorer quality, made in the suburbs, with a mesh known as Binche, was called "Fausse" or "Batarde Valenciennes."

At the time of the French Revolution workers fled to Belgium—Alost, Ypres, Ghent, Courtrai, and Bruges; the meshes in Valenciennes made in these places differed and were distinguished from one another by the number of twists and the shape. The Valenciennes laces made at

¹⁰ Another name was *œil de perdrix*, and a similar ground is now introduced into machine-made laces, and is known as the "pheasant's eye."

Courtrai were the best. In these, the mesh was diamond shaped, whereas in that made at Bruges it was round.

Lille laces date from 1582 or earlier. The patterns are simple and are strongly outlined; the front is straight, with a row of picots; the ground, finer even than that of Mechlin, is generally sprinkled with fine point d'esprit spots; this ground, known as "fond simple" or "fond chant", is entirely twisted and not plaited.

(c) *Silk laces*.—The Duchesse de Longueville established the manufacture of silk lace at Chantilly early in the seventeenth century. White and black silk lace were both made. Black Chantilly became especially famous; being made of yarn of such a peculiar twist that the luster was much diminished, it was thought to be flax, dyed black, such material being called "grenadine d'Alais." The ground was the "fond simple" or the "fond chant", an abbreviation of Chantilly, which is a net similar to Point de Paris, and has been described as diamond shaped, crossed by two horizontal threads. Another net used in certain portions of the pattern was "fond marriage", now known as Grecian net. The patterns were often of vases of flowers and other decorations similar to the ornaments on Chantilly pottery. This lace enjoyed great favor about 1840, when wide flounces were very popular and found a large and ready market. The Empress Eugénie favored the style, and this brought it into general use in court circles. During the war of 1870 the factory at Chantilly passed into bankruptcy. Such hand-made lace of this style as is now produced in France comes from Bayeux and Caen. Chantilly lace was usually made with 13, 14, 16, and 18 meshes per inch, but that made at Bayeux has 22, 24, 30, or even 36 to 40 meshes to the inch, which possibly is of a fineness that never will be surpassed.

Blonde silk lace was made of unbleached silk about the year 1745. It was made at Chantilly, Bayeux, Caen, and throughout the Department of Calvados, and at Le Puy. This lace was made of two distinct kinds of silk thread, fine silk for the ground and thick silk for the toile of the motifs which were very thickly woven. The patterns were of large flowers and sprays of leaves appropriate to the size of the mantillas and other articles of which this lace formed the basic finished material. Marie Antoinette gave the lace a special vogue; white mantillas were then used for full-dress occasions and "black blondes" for "second best." The Empress Eugénie also favored Chantilly, and to this day there is always some use of this type of lace.

(d) *Real lace articles, other than edgings and insertions*.—Production of hand-made lace has never been confined to edgings and insertings for trimming. By modifications of the ordinary methods, articles for household use are now produced in large quantities—window curtains, lamp shades, furniture laces, table linens, cushion covers, chair backs, and bed covers; these things made of real lace find a ready sale in an ever-widening market. It is almost inevitable that in an art which appeals so much to the imagination and the inventive faculty, attempts should be made to produce articles which cannot be commercialized. References to two instances of this will suffice: M. Ernest Lefébure, in *Histoire de la Dentelle à Bayeux*, describes a shawl shown at the exhibition at Caen in 1803 as being 60 inches square and made in one piece, requiring 3,000 spindles and 18,000 pins, and occupying the time of 3 workers for 6 months. The wrapper of "Point Colbert", which the Duchesse Santaona wore at the wedding of the

King of Spain, required 5 years of work and was sold for 50,000 francs (\$9,650). The Empress Josephine spent 225,906 francs (\$43,600) in 6 years on laces alone, and Napoleon at the time of his marriage to Marie Louise spent 71,399 francs (\$13,780) on laces which he purchased from one firm in Bayeux. The superb style of lace called Point d'Alençon always commands fabulous prices. Napoleon III in 1859 paid 200,000 francs (\$38,000) for an Alençon lace dress for the Empress Eugénie.

3. Flanders (Belgium)

Hand-made laces of Belgium were formerly mainly pillow and bobbin laces. Probably the most famous of all of them is Mechlin or Malines, first produced in 1681. It is made in one piece, toile and réseau together; the mesh is hexagonal, and sometimes the patterns include fancy meshes, fond de neige, and others having a charming irregularity. The characteristic figures are flowers, the scallop is shallow, and the ground is sown with spots; the flowers are Flemish, the spots are French; and a distinguishing feature is the outlining of the pattern with a flat cord. M. Lefébure says: "It is without question the prettiest of all pillow laces." It was formerly made at Liège and Antwerp, but the manufacture of it is now confined to Turnhout. That made at Antwerp is characterized by a pot or vase of flowers and is called "Potten Kant."

This flowerpot was a symbol of the Annunciation. In the early representations of the appearance of the Angel Gabriel to the Virgin Mary, lilies are placed in his hand or set as an accessory in a vase. As the influence of religion declined the angel disappeared, and the lily pot became a vase of flowers; subsequently the Virgin was omitted, and there remained only the vase of flowers.

Point de Flandre was of two kinds—à brides and à réseau. In the eighteenth century the patterns varied at different periods; in the early portion, rococco; in the middle period, wavy lines; and at the close, small detached sprigs. Elaborate pieces were made for ecclesiastical use, and the services of such famous designers as Berain and Le Brun were requisitioned. Guipure de Flandre was made with motifs joined by brides with picots. Point Flandre à réseau, made in the latter part of the seventeenth century, was called Point D'Angleterre; the name is explained in a later section dealing with the laces of England. In Point D'Angleterre, flowers were sometimes needle-made and were worked into a droschel ground or the ground was fitted around the flowers. "Brussels lace", also called Point de Bruxelles, is identified with many styles. The term is applied particularly to an eighteenth-century imitation of Point d'Alençon. The net was made in strips an inch wide, called droschel, which were joined by the Point de Raccroc, an invisible stitch invented by Cahanet. The pattern was outlined with a firm cordonnet. These laces, all made with fine linen thread, are of excellent quality and owe something to Italian influence.

Other Flemish pillow and bobbin laces were Valenciennes and Binche; these, like Mechlin, were made in continuous pieces by the process called "fil continuo." Valenciennes were first made in Belgium about 1656 at Ypres, Ghent, Courtrai, and Menin. A style called Valenciennes Brabant, in which the pattern was made independently of the ground, which was fitted around the motifs, enabled the width of the lace or the article to be much increased.

In the latter part of the seventeenth century the influence of the needlepoint laces of Venice was felt in the Low Countries, where the first *réseau* made was needlepoint. The principal lace products of the country, however, continued to be of the pillow and bobbin type. In 1860 Brussels workers, wishing to return to the best traditions of needlepoint, began the manufacture of a new style called *Point Gaze* (sometimes called *Rose Point*). This lace is famous for the great diversity of its patterns, the variety of its fillings, and the fineness of some of its filaments.

About the year 1720 a new style called "*Duchesse*" was introduced. A modernized form of *Point de Flanders*; this style is one of the most popular and commercially important at the present time. The flowers of the pattern are made on the pillow. A distinguishing feature of this lace is that the direction of the threads follows the shape of the flowers. These flowers are known as *pièces rapportées*, and are assembled and grouped and joined by imperceptibly fine stitches and brides. Sometimes a *réseau* is introduced in small pieces, which if hand-made contains needlemade motifs and is called *rose point*; occasionally the net is machine-made, therefore *Duchesse* lace may be a subtle combination of needlepoint, pillow, and machine-made lace. The objects are outlined à *cordonnet*. *Duchesse* lace is made at Ghent, Alost, and Wetteren. A coarse type made at Bruges is known as *Dentelle de Bruges*. The difference between the two types may be gaged by the fact that one is spoken of as being feminine and the other masculine, "*La Duchesse*" and "*Le Bruges*." *Duchesse* lace is sometimes described as "*Brussels lace*", but the latter name is given to fine laces without reference to style or place of origin. The three names, *Duchesse*, *Brussels*, and *Honiton*, all refer to similar lace.

In the first half of the nineteenth century, bobbin-made flowers were applied to machine-made net; and this was called "*Application de Bruxelles*" or *applique* lace. In 1850 the same sprigs and needlepoint motifs were applied to hand-made net, and the lace was called "*Application d'Angleterre*."

Silk lace has never attained a prominent position among the laces made in Belgium, but some black *Chantilly* is made at Grammont, although production is unimportant compared with that of Bayeux and Caen in France. In addition to the places already mentioned, hand-made lace is produced at Binche, Liège, Louvain, Malines (Mechlin), Mons, and Tournai.

4. Spain

It is debatable whether the origin of lacemaking in Spain can be traced to a Flemish or an Italian source. In the sixteenth century, when the Low Countries were part of the Spanish dominions, large quantities of lace were imported from Flanders; thus Flemish styles were transferred to Spain, but *Gros Point de Venise* and *Point Rose* were imported from Italy by the Spanish churches and Italian styles were transferred to Flanders. Later the lace imported for religious purposes was imitated by nuns in convents. In 1830 when the Spanish monastic orders were dissolved, many splendid specimens of "*Spanish Point*" came suddenly into the market, and were eagerly purchased; much of this, however, was Italian *Point de Venise*. Much gold and silver lace was made in Spain, and later a heavy silk lace, both in black and white, was produced, mainly at La Manchita

in Catalonia and at Barcelona, the principal seat of the manufacture of the national mantilla. There were said to be 12,000 lace workers in Spain in 1809 and 34,000 in 1869.

5. Germany

Barbara Uttman introduced the making of bobbin lace into the *Erzgebirge*, the district between Saxony and Bohemia. Bobbin lace-making is now taught in schools in Saxony, Bavaria, and Wurtemberg. These schools are attended by children between the ages of 5 and 14; the work is provided by dealers who supply pattern, bobbin, paper, and thread and take over the finished product against a price based on hourly wages. Lace is also produced in the Rhenish Province of Prussia, the Principality of Gotha, and Schleswig. Since 1647 the adjacent country of Denmark has produced a style of drawn work called *Tonderlace* and in the Scandinavian Peninsula there is an elaborate drawn work and an established style called *Dalecarlian lace*.

6. The islands of the Mediterranean Sea

Lace is made in the islands of Malta, Gozo, Comino, and Cyprus. The art was introduced into the island of Malta from the city of Genoa as early as 1640, but the styles made at the present time date from 1833. This lace, entirely pillow and bobbin made, was originally of linen but is now almost entirely of silk.¹¹ The patterns consist of arabesques united by a picot ground. Characteristic objects are the Maltese cross and the Genoese leaf. The production consists of edges, most of which have the characteristic lower edge known in the Levers lace industry as a "*crown front*", and articles, place mats, table runners, and handkerchiefs of linen and silk trimmed with lace. The work is carried on as a home industry. Sometimes the merchants furnish the material and collect the product, paying the peasants for the work, but as a rule the peasants purchase the thread and sell the finished product to the merchants.

7. Other countries of continental Europe

Hand-made lace is produced in other countries of continental Europe among which are Austria, Czechoslovakia, Greece (Crete), Hungary, Switzerland, and Russia. The patterns produced in Russia are vermiculate in form and of an oriental and barbaric style. The amount made is negligible.

8. England

Tradition ascribes the introduction of the art of making lace in England to Catherine of Aragon, and the workers of Northamptonshire still celebrate St. Catherine's Day. Cutwork, sometimes containing human figures and Biblical scenes, was made and even inserted into the darned samples made in the late sixteenth century. Reference is made in the inventory of the possessions of Mary, Queen of Scots, to *Hollie lace*. This lace was made of narrow needlepoint strips and medallions to be inserted into babies' caps, the patterns being in imitation of the Dutch *Potten Kant* or *Lily of the Annunciation*. During the reign of Queen Elizabeth the style was mostly *Reticella*, but in 1563, Flemish Huguenot refugees, fleeing the perse-

¹¹ The silk thread, sizes nos. 14, 15, and 16, is imported from London and linen thread, sizes nos. 50 to 110, is imported from Scotland. The material is generally white; a small percentage is black; colors are never used.

cution of Alva and the "Spanish Fury", carried the industry into the county of Kent. In 1568 other refugees from Mechlin settled in Bedford and Buckinghamshire, and a further influx in 1572 carried the industry to the south and west of England—Wiltshire, Dorset, Devonshire, and the neighborhood of Honiton, a town which still has families with Flemish names. In the counties of Devonshire, Dorset, Buckingham, and Suffolk the lace was pillow and bobbin made, that of the two last-named counties resembling the laces of Mechlin and Lille. In the reign of Charles I, Van Dyke Points were fashionable; these were of needlepoint with broad rounded scallops and with geometrical patterns and floral motifs.

Honiton lace, with which name English hand-made lace is generally identified, resembled Brussels lace of the middle of the eighteenth century. Net was made by hand and the price of purchase was found by covering the surface with shillings. Guipure sprigs made on the pillow and bobbin were applied to hand-made net and after 1825 to machine-made net. This lace, called Honiton Point, is similar in appearance, when the objects are joined by brides, to the Duchesse lace of Brussels and the tape guipures of Flanders.

In 1851 the making of cotton laces similar in style to Maltese was introduced into Northamptonshire.¹² The making of lace never acquired a footing in Scotland, the only style of note made there being a cheap torchon called "Hamilton."

(a) *Point d'Angleterre*.—There has been considerable controversy as to whether the lace called Point d'Angleterre came from Flanders or was first made in Devonshire. In the reign of Charles II, the importation of Flemish lace was so large that in 1662¹³ a law was passed prohibiting the importation into England of foreign lace and cutwork. Thereupon an elaborate system of smuggling commenced. Brussels lace, surreptitiously brought into the country in great quantities, was sold as a Devon product under the name of "Point d'Angleterre." There can be little doubt that this was Point de Flandre à réseau; the advocates of the British manufacture have never brought forward convincing arguments to the contrary.

9. Ireland

Production of lace in Ireland in the eighteenth century consisted chiefly of European styles. A typically Irish lace did not appear until about 1820, when Carrick-ma-crosse appliqué on net, and Carrick-ma-crosse guipure, with needlework fillings, were introduced. In 1829 Limerick needle-run patterns on net were introduced by Walker. These laces initiated new styles. Carrick-ma-crosse appliqué consists of shapes cut from cambric, appliqué on a machine-made net ground and ornamented with fancy stitches; Carrick-ma-crosse guipure has no net foundation; pieces are cut from cloth leaving flower shapes which are buttonholed on the edges and joined by picot brides. The style is from India or Persia, but according to the Florentine historian Vasari is said to have been invented by the Italian painter Botticelli. The making of this style was revived in 1846 after the potato famine. Both laces are still made in different parts of Ireland.

¹² English lace makers are slow to adapt their work to changes in fashion, and lag behind their coworkers in France and Belgium; the production of hand-made lace in England is small and that of Honiton is almost extinct.

¹³ A further act was passed in 1698 and caused a tariff war with Spain, then in possession of Flanders, which retaliated by prohibiting the importation of English wool.

In crochet lace, first introduced into Ireland in 1845, Point de Venise patterns were imitated. Crochet lace cannot be regarded as either needlepoint or pillow and bobbin lace. Having no cloth foundation, it was looped and made with the aid of the fingers rather than pins. It is now made in France, Belgium, Italy, and China. Tatting is akin to crochet lace. These styles of lace are native to Ireland.

Other needlepoint laces, copies of European production, are: Raised Point de Venise, or Rose Point, made at Innishmacsaint, in 1849; Plat Point de Venise (called Irish Point), made in 1846 at the Presentation convent, Youghal, County Cork. Drawn work and Reticella were formerly made at Newton Barry; an imitation of Honiton was made at Parsonstown, and a tape or cord lace at Ardee. Other places where laces are made or have been produced are Killarney, Waterford, Kinsdale, Cork, and Clones.

10. Other countries

Hand-made lace has been produced in every continent. *Asia*—Turkey in Asia, Armenia, and Syria; India, the Madras Presidency; Ceylon, Japan, Indo-China, and China, which is now the principal producing country and the trade of which is described in another section. *Africa*—Morocco, Tunis, Madagascar, the Madeira Islands, and Teneriffe, where the production of lace shows traces of Portuguese influence. *South America*—Brazil and Paraguay. In the latter country a style of needlepoint lace called Nanduti, or toile d'araignée, is made by the natives from silk, aloe fiber, or fine cotton yarn and resembles the lace made in Teneriffe. *North America*—Hand-made lace has never been made in the United States in sufficient quantities to constitute a commercial commodity. Plate VII, illustrating the article "Lace" in volume 13 of the fourteenth edition of the Encyclopedia Britannica gives an illustration of a "bobbin lace, Mechlin type, of American workmanship, possibly made at Ipswich, Mass.; the arms closely resemble those of the Washington family". The bibliography names the following books, dealing with American hand-made lace:

- F. A. Noble. *The Pilgrims*. Boston, 1907.
- A. H. Wharton. *Colonial Days and Dames*. Philadelphia, 1908.
- J. Fewkes. *Fine thread, lace, and hosiery in Ipswich*. Published by the Ipswich, Mass., Historical Society, 1914.
- T. F. Waters. *Ipswich Mills factories*. Historical Society, 1914.
- Frances Morris and Marian Hague. *Antique laces of American collectors* (1922-28).
- E. R. Vanderpoel. *American Lace and Lace Makers* (New Haven, 1924). *The Needle and Bobbin Club Bulletins* (New York, 1916-25).

There is no available record of the production of lace in Australia or in New Zealand.

IV. LABOR

The production of hand-made lace commenced in Europe as an art, and became a craft. Modern developments in China have transformed the craft into an industry and have shown that when production is commercialized on a quantity basis the article loses all connection with romance, and much of its prestige. In the early centuries of the craft, workers were bound by oath taken on the Four Gospels to work only for certain dealers; this oath was held by the poorest of them to be inviolable, and instances occurred when they suffered actual want rather than break it. Patterns were handed down in families from

generation to generation and were regarded as valuable heirlooms. Estimates of the number of workers employed, in the different countries, in the production of hand-made lace, are not satisfactory. They are, only too evidently, estimates, and it does not appear that a real census was ever taken.

V. DECLINE OF THE EUROPEAN INDUSTRY

Four major reasons for the great decline in the production of hand-made laces during the last century are:

1. The change in the style of dress for both men and women for court functions and fashionable assemblies. This change has militated strongly against the use of hand-made lace as an article of personal adornment, and it cannot be said that there is any indication of a revival of demand.

2. The rise of the machine-made lace industry, which has been remarkable during the last century. The products of the Levers lace machine, the bobbinet-Jacquard machine (Lyons Alençon lace), the Barmen lace machine, and the schiffli machine (embroidered and burnt-out lace), are so varied and elaborate, and relatively cheap, that they have displaced to a large extent hand-made laces.

3. The unwillingness of women to undertake such sedentary, tedious, and ill-paid work, when industry offers chances of more active, varied, and better paid work in other directions.

4. The growing lack of appreciation. Upon this point Paul Rudolph in an article in *Melliand's Textilberichte* for January 1924, states:

* * * Many of our women know nothing about lace; they cannot even distinguish sewn lace from bobbin lace, or hand-made from machine-made lace. Women who would be ashamed to paint, decorate their clothing, their underwear, and their homes in incomprehensible nonchalance with the falsehood of false lace. Modern man has manifestly lost feeling for the beauty of real lace, and in this domain is more uneducated and duller than in regard to any other branch of art.

This can only be changed if our women will endeavor to include the technique of lace amongst their handicrafts; for only by learning to understand technical difficulties will they acquire respect for the ability of their poorer sisters, and take real satisfaction in the value of lace work. Among the Greeks this appreciation of the handicrafts existed; textile products made by women were rated higher in value than adornments of gold and silver.

Within the last few years more than one firm of hand-made lace dealers has gone out of business, and in 1924 a firm of London lace merchants which had been in business continuously since 1769, 155 years, closed the doors.

VI. BIBLIOGRAPHY—HAND-MADE LACE

A considerable amount of literature has grown around the art of hand lacemaking. A *Lace Guide for Makers and Collectors*, by Gertrude Whiting, lists no less than 1,958 books of reference upon the subject. Probably the first books dealing with lace were the pattern books published in the sixteenth century. Two appeared in 1527, one at Venice, and the other at Cologne, and a third at Paris, in 1530. The most famous was that by Frederico de Vinciolo, published at Paris in 1587. Others were published by Cesare Vecielio in 1592, Isabella Catanea Parasole, 1600; Pagan Urbani and others followed, and numerous pattern books appeared in England, France, Germany, Italy, and the Netherlands.

The following is a selection from the list of books published upon the subject of hand-made lace in various languages:

Country	Date	Name of work	Author
England	1869	History of Lace	Mrs. Bury Palliser.
	1902	do	Edited by M. Joudain and Alice Dryden.
	1881	Ancient Needle-Point and Pillow Lace	Alan S. Cole.
	1887		
	1892		
	1900		
	1900	Hand-made Lace	F. Neville Jackson.
	1900	Lace Making in the Midlands, Past and Present.	C. C. Channer and M. E. Roberts.
	1905	Point and Pillow Lace	A. M. Sharp.
	1907	Devon Pillow Lace	A. Fenderel Moody.
	1908	Seven Centuries of Lace	Mr. J. H. Pollen.
	1908	Old Lace	M. Jourdain.
	1914	The Romance of the Lace Pillow	Thomas Wright.
	1922	The Lace and Embroidery Collector	Mrs. Head.
France	1875	The Queens Book of Lace	Alan S. Cole.
		La Dentelle, Histoire, Designation, Fabrication.	Sequin.
	1886	Historie du Point d'Alençon	Madame G. Despierres.
	1887	Les Dentelles Anciennes	J. Béal.
	1888	Musée retrospectif Dentelles a l'exposition universelle internationale de 1900 a Paris.	Rapport d'E. Lefébure.
	1902	La Dentelle et la Broderie sur tulle 1902	Pierre Verhoyen.
	1905	Le Point de France et les autres dentellières au XVII et au XVIII siècles.	Madame Lamence de Laprade.
	1906	Les Broderies et Dentelles Françaises et étrangères.	M. Charles and L. Pagés.
	1912	Les Points de France	Ernest Lefébure, translated by M. T. Johnson.
		Embroidery and Lace, Their Manufacture and History from the Remotest Antiquity to the Present Day.	Ernest Lefébure, translated by Alan S. Cole.
	1922	Le Trésor de l'Art dentellière	A. Carlier de Lantshire.
	1900	Die Spitzenindustrie in Belgien und Frankreich.	Bernard Dietrich.
Belgium		Enterisklings-gesichte der spitze	Morris Dreger.
		Irische Spitzen	Morris Dreger, introduction by Alan S. Cole.
Germany	1902		G. M. Urbain de Cheltot, translated by Lady Layard.
			Elisa Ricci.
Italy	1878	A Technical History of the Manufacture of Venetian Lace.	
	1908	Antiche trine Italiane	

CHAPTER IX

HISTORICAL DATA

THE ORIGIN AND DEVELOPMENT OF LACE MACHINES

The old town of Nottingham is closely identified with medieval history, and there is much to be said in support of the claim that it was the cradle of several textile trades. It was prominent in the development of the early woolen business, for there was a wool cloth trade in Nottingham by the end of the tenth century, and in the establishment of the English dyeing industry. From 1586 onward, there is abundant proof that it was connected with the inception and fostering of cotton spinning, hosiery, lace, and embroidery making, with their numerous branches and affiliations.

It was always noted for the skill of its mechanics. A proverb runs that "the little smith of Nottingham can do the work no other man can." The two most famous inventors in the cotton trade, James Hargreaves and Richard Arkwright, made their first essays in Nottingham. In 1767 Hargreaves brought out the "spinning jenny", and in 1769 Arkwright invented the roller spinning machine. Arkwright's mill, claimed by some to be the first cotton spinning mill erected in the world, was worked by horse power, that is, by actual horses.

The origin of the lace machine must be sought in the kindred trade of hosiery. In 1586, William Lee, a country parson, who lived at Calverton, near Nottingham, invented the knitting frame. This was absolutely original and not a modification of a previous invention. The various modifications of the knitting frame, which were introduced from time to time, eventually led to the production, in 1758, of a crude net. This was the invention of Jedediah Strutt, who 2 years later produced a cheap net to take the place of hand-made net. In 1768 Crane made a looped net, and in the following year Robert Frost produced a plain lacey webbing. Frost and Holmes, in 1780, made net which was embroidered by hand, and which was the first step toward machine-made lace. Caillon, working independently, had produced the same thing in France at about 1780 and from this date, when the French commenced to build their own machines, down to 1810, the list of their inventions is an index of the extraordinary interest they took in the matter.

Crane had built the first warp machine in 1775, and 20 years later it was possible to weave a pattern on a ground. France, Germany, Italy, and Spain took up the machine and the French mounted fine appliqué work on the knitted netting. Warp machines, of a much improved type, are still in use. The machinery was, more or less, in a state of transition, and slowly but surely the crude stocking frame was evolving into the highly elaborate lace machine. In 1786 Flint invented the point bar; in 1796 Dawson applied rotary

movement to the machine and cams and wheels to move the bars. The bars kept the warp threads at equal distances, and the cams moved them following the requirements of the twist. A little later Brown and Copestake made Mechlin net on the warp machine.

Lindley invented the bobbin in 1799, and Irving and Skelton devised the spring which regulates the speed at which the thread is withdrawn.

Robert Brown in 1802 patented a fish net machine—the immediate precursor of the first lace machine.

From the time of the first appearance of net until the early part of the nineteenth century, the history of its manufacture is marked by records of perpetual endeavor to produce an article which would not unravel. A fast mesh was desired, and the names of Crane, Else, Harvey, Hammond, Lindley, Frost, Holmes, Morris, and Jacquard were all identified with the efforts put forth to attain this end, but the problem of producing a stable fabric remained unsolved. So great was the mystery and such the number of abortive attempts made during 40 years that the projectors were ranked amongst enthusiasts seeking to obtain perpetual motion.

John Heathcoat, in 1808, patented his first bobbinet machine, suggested by the machinery he had seen used in making fishing nets, and so called from the threads which cross the warp being supplied from bobbins, which worked threads from a semicircular frame and made narrow strips of net 3 inches in width and joined together. The advantages which would accrue from the production of wider breadths were so apparent that Heathcoat entered upon the task of devising means to attain this end. An examination of the hand-made net demonstrated that part of the threads worked in the same direction throughout the piece. He, therefore, placed all these threads on a main beam, which enabled him to reduce the width of the beam to the same width as the lace, whereas, previously the width of the semicircular frame which held the spools from which the threads worked was many times the width of the net produced. His second patent was taken out in 1809, and he started a factory at Loughborough, in Leicestershire. The newly patented machine produced strips of 18 inches in width, and as early as 1810, several thousand people were occupied in making the net and tambouring and running in patterns with the needle. The machine was called "Old Loughborough;" with the exception of the Jacquard it combined the essential parts of all subsequent lace machines—combs, points, bars, bobbins, and carriages. The size of the machine was gradually increased to produce pieces of 30, 36, and 54 inches in width. The reigning Queen Consort gave the invention her patronage and, later, Queen Victoria's wedding dress was made of Honiton sprigs applied onto machine-made net. Royal approval gave the article great popularity and manufacturers a considerable amount of prosperity. Heathcoat, as usual with successful men, had his detractors who disputed his claims, at law, but the fact remains that he is remembered and they are forgotten.

Felkin in *The History of Machine Wrought Hosiery and Lace Manufacture* pays the following tribute to Heathcoat:

Heathcoat's services to Nottingham's may be stated in one sentence. His inventions gave to it a trade, which within 50 years has mainly assisted to quadruple its population, giving employment year by year, at fair wages, to probably 150,000 work people, and for the past 30 years made an annual average addition of £4,000,000 sterling to the trade of the country.

OPPOSITION TO THE BOBBINET MACHINE FROM HAND WORKERS

The introduction of machinery for making lace was not accomplished without bitter enmity and opposition from hand workers. The Luddite riots in Nottingham and the neighborhood in 1811 and the following years are a matter of history, as is the special legislation enacted by Parliament to protect the lives and property of those engaged in building the lace machine and advocating its use. The innovation of another textile inventor was accorded the same opposition. The hand weavers of France, at the end of the eighteenth century, ridiculed the invention of the jacquard and its application to the loom; when it became a competitive factor, by eliminating the necessity for their employment, they essayed to destroy it, and mobbed the inventor, because he had revolutionized conditions in their business over night.

Hand-made bobbinet in 1809 was sold for £5 sterling per square yard. The price of the machine-made article, on the expiration of Heathcoat's patent in 1823, was 8d. per square yard. A 24-rack piece, 45 inches wide of machine-made bobbinet was sold for £17 sterling in 1814, and in 1834 the price was reduced to 7s. The twist-hand in 1814, received 3s. 6d. per rack for making this article and in 1834 his wage was reduced to 1d. per rack.

Before 1816 England was so jealous of her net trade that laws were passed to punish, by banishment or death, whoever took machines abroad. In 1816 the separate parts of a machine, mixed with old iron were smuggled into France, and the industry was soon firmly established there. Heathcoat established a factory of his own at Paris in 1818, which he transferred to St. Quentin in 1826.

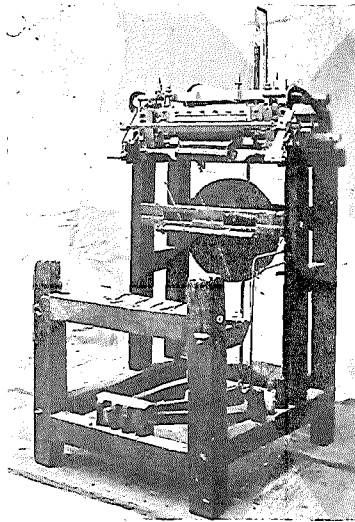
The whole tradition of lacemaking was uprooted upon the expiration of Heathcoat's patent, and from 1823 to 1825 there raged what was known as the "Twist-net fever." The following extract from the article "Bobbinet" in Cole's Dictionary of Dry Goods describes this:

Nottingham and the adjoining towns became the scene of an epidemic mania; many, though nearly devoid of mechanical genius or the constructive talent, tormented themselves night and day with projects of bobbins, pushers, lockers, point bars, and needles of various forms, endeavoring to get around or improve the Heathcoat patent, till their minds got permanently bewildered. Several lost their senses altogether, and some after cherishing visions of wealth as in the olden time of alchemy, finding their schemes abortive, sank into despair and committed suicide.

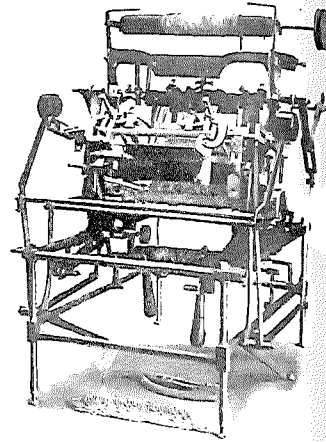
Heathcoat, like Leonardo da Vinci, appears to have been a man of an inventive turn of mind. His patent for making lace with spindles, no. 4867, taken out in 1823, antedated in some particulars the machine invented by Malhère for imitating hand-made lace, which is described later. The tension of the threads did not alter when the spindles changed places, it was possible for a spindle to remain quiescent, and the machine stopped automatically on the breaking of a thread. A reading of his patent no. 6267, of 1832, indicates that it was for a caterpillar tractor, which is the foundation of the army tank.

Most of the basic improvements and modifications and later developments of these complex and intricate machines have originated in Nottingham. John Brown & Freeman, in 1811, constructed a machine in which the warp threads and not the bobbin threads had a

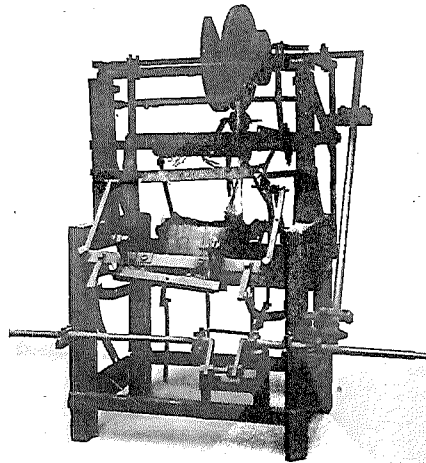
PLATE 19



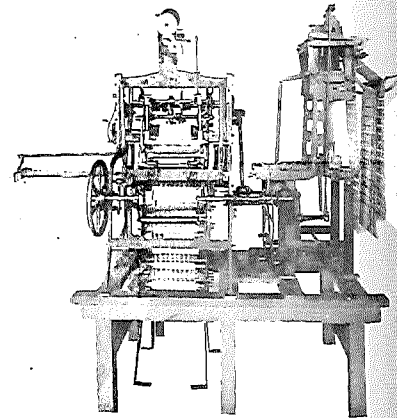
STOCKING HAND FRAME.
Invented 1589



HEATHCOAT'S SECOND BOBBIN NET
MACHINE.
Invented 1809.



EARLY LEVERS-LACE MACHINE.
1826-1840.



EARLY LEVERS LACE MACHINE WITH
MANCHESTER JACQUARD.

traversing movement. The Pusher machine was invented in 1812 by S. Clark and J. Mart, and in 1813 Heathcoat modified his own machine to the extent that the bobbins traversed a definite width and turned again, instead of traveling the full width of the machine. The narrow breadths of lace which were produced are called quillings. The most important and far-reaching changes made in the construction of the machine, however, were devised by John Leavers, who, working in collaboration with his two brothers and his nephew, conceived the idea of placing all the carriages in one tier, with one fixed, constant motion in one gait instead of traversing the machine as in Heathcoat's machine. This arrangement is the chief ground of difference between Heathcoat's patent and Leavers' machines.

The Levers machine.—This invention dates from 1813, and the essential principle is in use today in the modern Levers machine. The first machine was 18 inches wide; by 1825 this width had been increased to 60 inches. These early machines traveled 80 to 90 motions per minute. They were used solely for making plain net until in 1823, J. Bertie and R. Biddle devised a method of making breadths on them. The essential difference in operating the carriages made the production of a fancy lace possible, an achievement that could never have been possible with carriages traversing the whole width of the machine.

The invention of Joseph Marie Jacquard had been applied to lace machines as early as 1824, but it was not until 1837 that Ferguson applied it to the bobbins of the bobbinet machine, using two guide bars, and making possible an endless variety of patterns. His complete machine was produced in France, for unfortunately he could not obtain the protection of patent laws in Nottingham. Through the conjunction of the circular bobbin-net frame and the jacquard, Ferguson produced black silk lace called "Dentelle de Cambrai", which was an imitation of hand-made Chantilly. The pattern was woven by the machine, and the brodé or relief was "run in." This lace is known today as "Lyons Alençon lace."

In 1841 Hooton Deverill applied the jacquard to the Levers machine, acting on the warp threads in independent bars. The machines, at first, were narrow and being operated by hand power, produced slowly; later the rotary system doubled the speed, and finally the power-driven machine gave a more rapid and regular production.

Before becoming the present enormous machine with such precise action, with an inside so delicate and its perfect jacquard, its indispensable complement, the primitive machine went through many changes, the complicated structure of today being an evolution of a century based upon Heathcoat's patent of 1809. Since the application of the jacquard, the alterations have been improvements and refinements rather than inventions, and the products of the machine have gone from strength to strength, constantly improving in quality and decreasing in price.

DEVELOPMENT OF THE PRODUCTS

Machine-made lace was, primarily, a plain net, composed of meshes of uniform shape, made the full width of the machine and cut up into such lengths and widths as were appropriate to the usage to which it was desired to apply it. It was embroidered, by hand,

more or less richly, but the product was still in its infancy. A little later this same net was made in bands of different widths, first of cotton and later of silk.

Attempts were made to imitate various kinds of net; little by little and after numerous trials and combinations, machine-made fancy lace was created. As early as 1823 Grecian net and bullet-hole and point d'esprit nets were made, but these still required embroidery by hand. But the application of the jacquard to the machine made available a system by which the motifs of the design could be encircled with outlining threads.

Machine-made lace is a triumph of mechanical ingenuity, and a greater amount of inventive genius has been devoted to its production than has been bestowed on any other branch of the textile industry. The possible variety of the products of a lace machine is, like most arts, infinite and many sided. Machine-made lace constantly sought to be an imitation, more or less perfect, of hand-made lace under most of its forms and in all its styles. There was a vast field to explore, and the problem was to make the machine produce the finest and most delicate fabric in existence and to supply by the parts of an ingenious apparatus the delicacy of touch and the dexterity of clever hands.

The solution of this complicated problem was thus described by a great French manufacturer:

It was the work of an entire century, by attempts tried again and again, through details which required eternal retouching and recommencements without end. What effort and what stubborn work, since the first years of the nineteenth century, passing from change to change, to make the work as complete and perfect as it is today, from the point of view of rapidity and economy! The effort to mold the classic styles to lace and to find new uses for it never ceases.

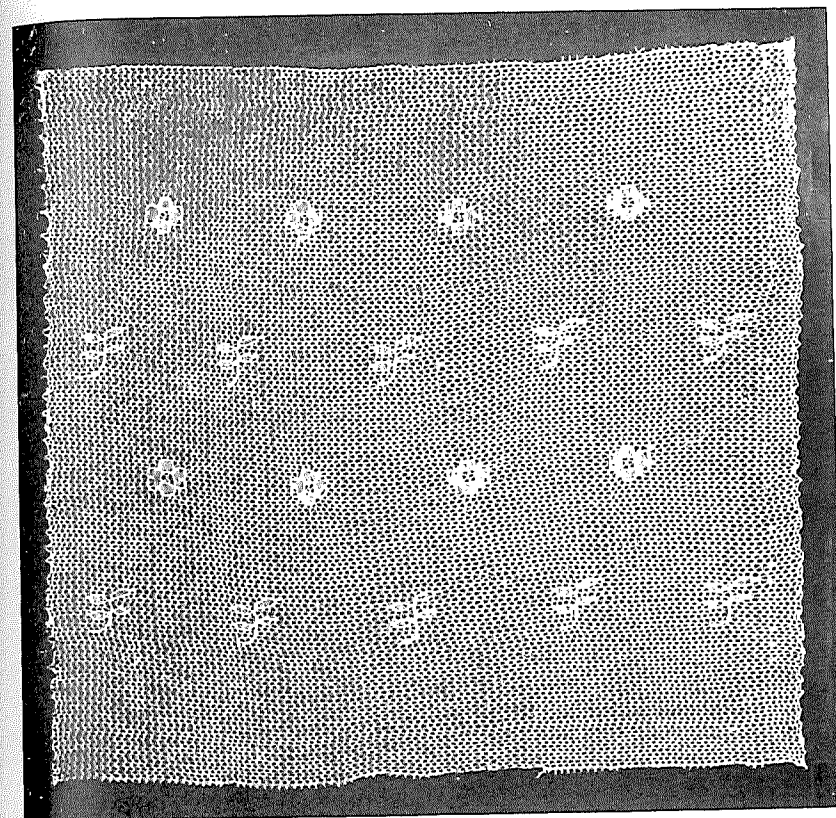
Without irreverence toward those clever and patient people to whom the world owes the art of making real lace it may be said that the stock bequeathed by them has been so carefully improved by machinery that the accumulated interest now exceeds the principal.

THE NOTTINGHAM LACE-CURTAIN MACHINE

It is stated in Cole's Dry Goods Dictionary that the use of curtains originated during the brilliant civilizations which were developed in a remote antiquity by India, China, and Egypt. The manufacture and arrangement of curtains and draperies then received as much attention as any of the noble arts, and throughout the centuries the use of curtains has formed an important feature in household decoration. Of the many materials utilized for this purpose during the past 75 years, lace has formed, by far, the greatest part.

John Livesey, a draftsman of Nottingham, produced an invention in 1846 which was applied to the circular machine. Figured objects were made on a net called "straight down loop." Single-, double-, and three-fold texture could be introduced as desired and intermixed with openwork, by the application of the jacquard apparatus at the end of the machine, acting upon one class of threads and of another jacquard at the back of the machine upon another class. Livesey was so well versed in the various types of machinery into which the manufacturing of lace had been subdivided that he could take parts from each and form new combinations.

PLATE 20



EARLIEST EXAMPLE OF MACHINE-MADE LACE. MADE BY ROBERT FROST OF NOTTINGHAM, 1769.

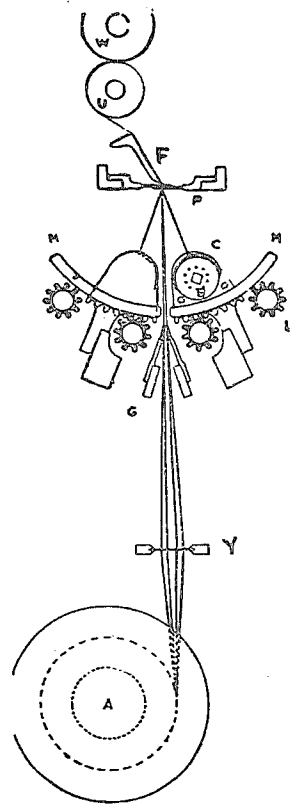


FIG. 1—Rolling Locker

W Work roller	M Comb
U Porcupine roller	L Fluted roller
F Facing bar	G Guides
P Points	Y Sley
C Carriage	A Warp beam
B Bobbin	

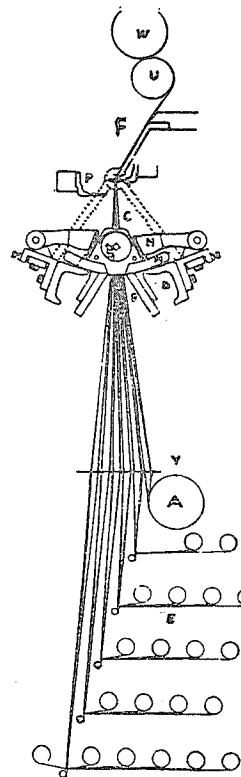


FIG. 2—Levers Machine

W Work roller	M Comb
U Porcupine roller	D Landing bar
F Facing bar	S Steel bars
P Points	Y Sley
H Catch bar	A Main beam
C Carriage	E Independent beams
B Bobbin	

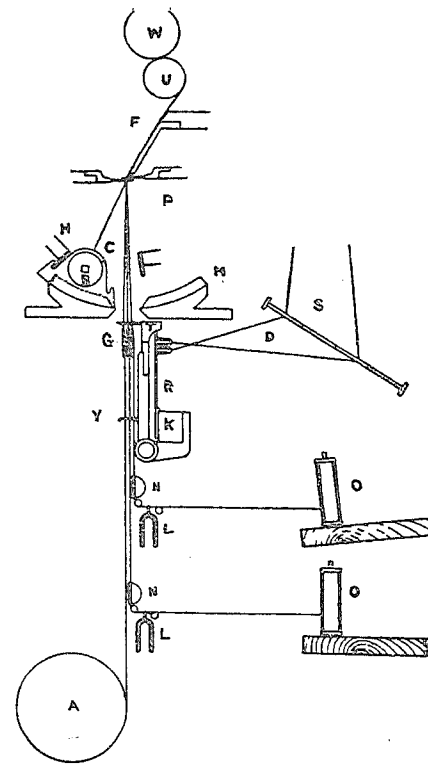


FIG. 3—Curtain Machine

W Work roller	M Comb	T Trick bar
U Porcupine roller	B Bobbin	N Nipping bar
F Facing bar	R Interceptor	S Spools
P Points	D Jacquard	Y Thread Sley
H Catch bar	G Guides	S String Sley
C Carriage	K Rocking bar	L Lingoe
		A Warp beam

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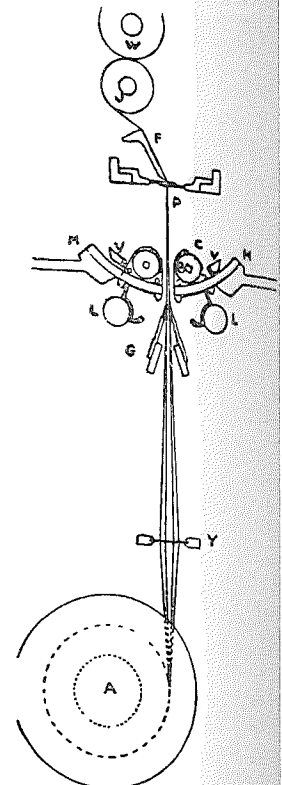


FIG. 4—Double Locker

W Work Roller	M Comb
U Porcupine roller	L Locker bar
F Facing bar	D Driving bar
P Points	Y Sley
C Carriage	A Warp beam
B Bobbin	

The names of Elsey, Sissling, and Cope are identified with that of Livesey in the development of the machine and they placed the second warp, wound on large spools, behind the machine. The type from which the Nottingham lace-curtain machine has developed was thus originated.

By the end of 1850 over 100 machines were making curtains in Nottingham; in 1851 the number had increased to 150, and in 1862 it had increased further to 300. In 1850 Triboulet & Co. commenced to make curtains in Calais, France.

The products of the Nottingham lace-curtain machine are now exceedingly diverse, but the three principal additions to, or modifications of the original type are known as bar ground, double spool or Swiss, and combination. There is no evidence to indicate to whom should be ascribed the credit for the adaptation of the principle of bar ground from other types of lace machinery to the Nottingham lace-curtain machine. It was, however, largely developed by Edwin Doughty, who elaborated it to the extent of producing Ensor net and other fancy styles on the curtain machine. Some of these were so uncommon that the inventor had to make affidavit that they were made on a curtain machine, and not on a Levers machine, before they were admitted to this country at the rate of duty which was assessed upon Nottingham lace-curtain machine products.

Double spool or Swiss work and combination work were both invented by William Tilson of Lenton about 1870.

COMMON ORIGIN OF THE THREE TYPES OF LACE MACHINERY

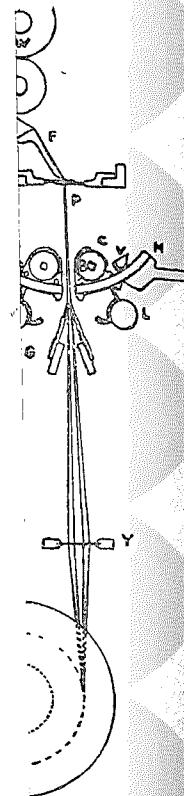
In a very general way it may be said that these three types of lace machines—the bobbinet machine, the Levers or go-through machine, and the Nottingham lace-curtain machine have the same fundamental principle, being based on Heathcoat's bobbinet machine, with the improvements effected by John Leavers. The dominant plans of subsequent inventors have been fourfold: To simplify the working of the interior parts of the machine, to lighten the toil of the workers, to increase the productive capacity of the machine and so cheapen the article, and to perfect the beauty of the product.

A lace machine, although intricate mechanically, is after all, but a machine, and its product is entirely dependent, except in the case of the bobbinet machine, upon the skill and capacity of the men who prepare the details of the pattern. The improvements of the artistic side follow mechanical progress, and it is to the clever draftsman that machine-made lace owes its legitimate success.

BRITISH LACE PATENTS

The British patent office groups together lacemaking, knitting, netting, braiding, and plaiting, and the manufacture of fringe and chenille, and according to the official publications the number of specifications which were filed from 1675 to 1866 was 59,222. The first patent for making lace was issued in 1675, but there is no indication whether the process was by hand or machinery.

William Felkin on page XVII of the introduction to *A History of the Machine Wrought Hosiery and Lace Manufactures* remarks on the many inventions, patents for which, in numbers and prolixity of specifications, were probably unexampled in any other manufacture.



Double Locker

M Comb
 L Locker bar
 G Guides
 Y Driving bar
 Y Elsey
 A Warp beam

the June 1934 issue of the

The specifications of these patents indicate the extent to which basic problems have occupied the minds of inventors, some of these problems remaining unsolved. As early as 1856, W. Crofts took out a patent to stop the machine automatically on the breaking of a bobbin thread. A French patent to eliminate bobbins and carriages and place all yarns upon warp beams would have been a great economy had it been successful and universally adopted.

Other patents have been superseded by superior methods of achieving the desired result, such as the system patented in 1883 decreasing the rapidity with which the work roller revolved as it became thicker, thus assuring uniformity of quality. This method is still used to a limited extent, but is being superseded by the porcupine roller. S. Whitehurst, in 1864, patented a machine for automatically "shelling" carriages and inserting and threading the full bobbins; other attempts were made by Boden, Wilcox and Gibbs, and Schiersand, but Jardine's machines have superseded these.

In 1894, W. Birks, W. J. Watson, and J. Taylor invented a system whereby the use of a pack of pattern cards in the lace curtain machine was obviated. The pattern was painted on a squared ground, of the same gage, in both directions, as the needles of the "grid", and this pattern placed upon the cylinder worked in an endless chain. This was, possibly, the origin of the system which is sometimes used as a substitute for reading the pattern.

The gradual evolution of the machinery, during a century, involved many different methods of working the bobbins and carriages and the warp threads such as—2 tiers of carriages, one above another; carriages inverted, and the work taken up beneath; working alternate bobbin threads transversely in the same manner as the warp threads, and working warp or beam threads from back to front in the same manner as bobbin threads; working all warp and beam threads from large brass bobbins. In addition many strange notions were essayed and the ingenious ideas which obtained are well illustrated by the following instances: Rewinding empty brass bobbins without removing them from the carriages; eliminating point bars and pressing the finished twists up to the lace already made by the action of the carriages; reversing the action of the roller in order to make a fan-shaped front on a torchon lace; working two bobbins in one long carriage in a bobbinet machine. In 1860 Messrs. L'Heureux took out a patent for—

certain mechanical processes whereby the warp threads used in the manufacture of imitation lace or blonde, either in narrow or wide widths, may be worked in such a manner that these threads may be made to follow without interruption, all the forms required for producing a design or pattern, without it being necessary that these threads should occupy the same position at each repetition of the pattern.

The gradual growth and development of the machinery, the jacquard, the uses of materials, the products of the machinery, and the improvements in the technic of the draftsmen are indicated in the following paragraphs:

IMPROVEMENTS IN THE MACHINES

The invention of the rack bell and pinion wheel, whereby it was possible to arrange a scale of payment for working a machine by a unit consisting of a definite number of motions, and not by the length of material produced or the time consumed in producing it, is discussed by Felkin in the following passage:

The question of an equitable mode of reckoning in payment for work done by those employed in the making of any kind of lace on the loom had for many years caused anger and contention, which increased with the rapid growth of the trade. The practice of the employers in taking in work from the machine was to measure out 12 stretched-out-arms' length of the piece, and consider them to be 12 yards, and to be paid for as such to the workman. This was manifestly so loose, and, by the necessity of the case, so unjust a mode of dealing with an elastic article like lace, as to make it a matter of surprise that it was borne with so long.

On August 24, 1809, the work people addressed the lace manufacturers then assembled to consider any measures proposed for the good of the trade, and pointed out the equity of paying by count in length, showing that the plan was quite feasible. Their memorial was signed and presented by John Blackner, the future historian, and three others on the part of the workmen. An instrument was devised by Handley, a lace maker of Nottingham, and Thomas Brookes, for the purpose of exact measurement by the movement of the machine itself acting upon a tooth and pinion wheel, to which were attached a bell and hammer which announced the completion of every 240 meshes in length. To show these, marks were placed on the selvages of the pieces.¹ This "rack", as it has ever since been called, was applied to the point net machines in 1810 by James Oakes, a workman of Sneinton, and by Mr. William Hayne; and in 1811 by Thomas Roper, a workman, to the warp machine; and to the carrier bar of the bobbin net machines by Jonathan Brown, afterward living at Calais; and not withstanding the objections of Mr. Nunn, a large lace manufacturer, at once became universal. It has since been the standard of measurement of labor in every department of the lace business, and of length from the maker in selling to the finisher for the market.

The following is a chronological list of important inventions of machines or improvements in the methods of producing Levers and other laces from 1835 to 1907:

Date	Name of patentee	Patent no.	Nature of invention or improvement
1835-----	Thomas Alcock, of Worcester-----	6764	Go-through system of working the carriages.
1844-----	J. W. Bagley-----	10390	Guide-bars.
1845-----	James Oldknow-----		Levers machine, 216 inches wide.
1846-----	William Livesey-----		The system for producing Nottingham lace curtains.
1849-----	James Oldknow-----	12897	Perforated steel bars. ¹
1860-----	Cope, Ward & Cope-----	2855	Simplifying and accelerating speed of motion of carriages.
1875-----			The go-through system based upon Alcock's invention of 1835 universally adopted.
1891-----	W. H. Smith-----	22417	Porcupine roller; conceived by Joseph Elsey in 1863 (629), by W. Hickling in 1864 (423), by M. G. Kent in 1880 (3159), and Léon Bomy, chief draftsman for Henri Hénon, who gave it to Humphrey, Botham, and Wyer. ²
1905-07-----	C. Hickton-----	{ 25542 11429 25632 }	{ Shogging of comb-bars of Levers lace machines to equalize the amount of yarn taken from the brass bobbins.

¹ This revolutionized the industry.

² The result was anticipated in Heathcoat's patent no. 4918, taken in 1824. An apparatus for giving off warp and taking up the lace so equally as to give invariable form and size to the meshes throughout the piece.

A patent was taken by F. Rebière in 1866 to combine the characteristics of the weaver's loom, the shuttle, and the Levers lace machine, but does not appear to have been commercially successful and no indication of machine or product is to be found today.

¹ The meshes of the piece were held to the integral shape by means of spur wheels applied to the selvage by Kendall and Morley in 1812.

IMPROVEMENTS IN THE JACQUARD

Attempts to diversify nets and introduce definite objects on to them have occupied the minds of inventors from the later decades of the eighteenth century. Among the principles which have been utilized for moving the guides holding the threads have been the Vaucanson chain, the organ barrel, the Dawson wheel, and the "nog." These all antedated the application of the jacquard; indeed the organ barrel and Dawson wheels were used before the jacquard was invented, and Dawson wheels or cams are still used in both the bobbinet and the Nottingham lace-curtain machines. The jacquard itself has undergone considerable modification before finally settling into its present form and has passed through the various stages known as the Manchester top, the Martyn jacquard, and the spring-dropper jacquard, which is now universally used in the Levers machine, although the curtain machine still uses one or more overhead jacquards of the Manchester type.

The following is a chronological list of important improvements and applications of the jacquard from 1824:

Date	Name of patentee	Patent no.	Nature of improvement
1824	Colas & Delompre, of Lyons		Application of jacquard to the Mechlin machine enabling the machine to produce patterned net.
1835	S. Draper	6907	Application of jacquard to the bobbinet machine.
1837	do	7491	Application of the jacquard to the warp machine.
1837	Champallier Fils Ainé and Pearson.		Ferguson's patented application of the jacquard to the circular bolt machine in France. ¹
1839	Wright		Application of jacquard to the pusher machine.
1841	Joseph Wragg		Encircling the objects of the pattern with thick threads by means of "nogs" of wood on the pattern cards.
1841	Hooton Deverill	8955	Application of the jacquard to the Levers machine.
1842	Brooks		Applied double cylinders to the jacquards.
1845	A. J. Topham		Manchester jacquard used for making net, and another jacquard for working gimps, and thick threads.
1848-49	Martyn & Farrands Bros		The Martyn jacquard, and the bottom-bar jacquard. ²
1851	David Birch		Spring-dropper jacquard, providing for a range of 7 gaits from a single cylinder.
1860	Wm. Hodgkinson	2349	Stump bars in conjunction with bottom bars.
1874	Henri Hénon		Worked 252 independent bars.
1877	J. White	2315	Patent for working 2 sets of droppers and bars from 1 row of holes in the jacquard cylinder, thus doubling the bar capacity of the machines without increasing the width of the jacquard.

¹ "Although the credit for the application of the jacquard is generally given to Ferguson, he only applied it to the bobbins of the bobbinet machine using guide bars. In 1841 Hooton Deverill applied it to the Levers machine acting on the warp threads in independent bars." *Histoire de Tulle, Ferguson.*

² These coming in the same year as Oldknow's invention of perforated steel bars practically completed the machines.

The abridged specification of Hooton Deverill's patent reads as follows:

Improvements in machinery for making and ornamenting lace, commonly called bobbinet lace. This invention consists in the application of the jacquard apparatus to a lace-making machine, such apparatus acting through the agency of jacks, tappets, and levers, for the purpose of shogging the guide bars or the

longitudinal bars in manufacturing various kinds of lace, and in producing ornamental figures or devices upon such fabrics. The patentee states that he does not confine himself to any particular form or arrangement of the parts of the mechanism employed in carrying out the invention, as they may be varied in several particulars, and yet be made to answer the same purpose. By this invention the Dawson wheels commonly employed, are dispensed with.

Other inventions.—Other mechanical inventions and processes which have been adapted to other industries than that of lacemaking, were the gassing of fabrics by Hall in 1817, and the centrifugal wringer, invented and patented by Manlove and Alliot, in the same year.

MATERIALS USED

Felkin's standard work on lacemaking states that cotton thread was first introduced by Cartledge in 1805 to replace linen thread in the producing of hand-made laces, but before that time and before the invention of Heathcoat's machine, fine cotton yarns for lacemaking and other purposes were spun. The following extract is taken from page 169 of Felkin's book:

Messrs. Houldsworth, of Manchester, became spinners of these fine first-quality yarns. Nos. 200 to 300 were principally used. Their nett list in 1805 was for no. 200, £3. 3s. 6d.; 220, £4. 1s. 6d.; 240, £5. 6s. 6d.; 260, £7. 3s. 6d.; 280, £9. 9s. 6d.; 300, £12. 8s. 6d. per lb. These prices continued for many years; and as finer numbers were enabled to be spun, still more extraordinary prices were obtained for them. It is said this house sold in one year £70,000 worth of fine yarns for lace-purposes alone. In 1812, no. 320 were sold for £15. 2s.; 340 for £22. 6s.; and 352 for £27. 8s. per pound. Well might that very clever and successful house say, when writing in reference to their lists of prices, "In making similar researches to these, it is some satisfaction to look back upon good old days, when profits and prices were more substantial than at present." No. 100 has been sold since then for 2s. 4d., and no. 200 for 7s. 6d. per pound.

The further use of different raw materials is shown as follows:

Date	Initiator or patentee	Patent no.	Description of yarn
1825	M. L. C. Dognin, of Lyons		Silk for bobbinets.
1844	Henry Boden	10214	Singles cotton, on the warp or bobbins, or both.
1848	Dognin and Isaac, of Lyons		Wool for Levers laces.
1850	Richard Birkin		Mohair for "Yak" laces.
1850	Dunncliffe and Bagley	13122	Silk for use in Levers machines. ¹
1851			Gold thread for use in Levers machines.
1852	M. S. Ferguson		Mohair in the brass bobbins.
1867	W. Gadd	939	Elastic netting on Levers machines for use in shoes.

¹ No illustrations of silk lace appear in Hénon's "L'Industrie des tulles et dentelles mécaniques", prior to 1851.

Other basic textiles and variants are used, but no data are available concerning the date of the first usage or the name of the persons using them. Among these textile materials are mercerized cotton; flax, ramie; spun silk; and rayon.

PRODUCTS OF THE MACHINES

The elaborate range of articles produced by lace machines today has evolved by slow degrees from simple commencements on the plain net and warp machines. The intensity of thought and application which were given to the production of these developments is

evidenced by the simultaneous invention of the same thing, by different workers in different countries, and sometimes on different machines. The sources of information are scanty, and in some cases contradictory as to dates, but it is believed that the following chronological list, which has been compiled from the abridged specifications of British patents and other English and French sources, is substantially correct:

Date	Producer or patentee	Patent no.	Product
1813	J. Heathcoat	3673	Quillings.
1816	Fawkes and Kirkman, simultaneously.		Purl on the warp machine.
1820	Syner		Grecian net on the pusher machine.
1823	M. S. Ferguson		Bullet-hole net.
1825	M. L. C. Dognin of Lyons		Illusion net.
1828	M. S. Ferguson	6208	Square net and Point de Paris.
1828	R. Birkin		Purl on the Levers machine.
1831	W. Sneath		Point d'esprit net on the circular bolt machine.
1832	G. Freeman		Point d'esprit net on the traverse warp machine.
1836	R. Birkin		Point d'esprit net on the Levers machine.
1837	S. Ferguson, Jr.	7090	Point de Cambrai.
1841	M. H. Black of Lille	10716	Platt Valenciennes.
1845	J. Fisher, J. Gibbons, and T. Roe		Scalloped laces.
1850	J. D. Dunncliffe and J. W. Bagley		Band front (tabby weaving) and purls made from twisted bobbins.
1851	J. Livesey		Chenille pile surface goods resembling velvets or plush.
1855			This year with its "Exposition Universelle" at Paris was the date of many improvements in the production of various styles which included Bruges, Duchesse, and Guipure.
1856	Pearson and Topham	945	"Crossband laces."
1857	R. and T. I. Birkin		"Crossband laces."
1859	Wm. Maxton		Independent beam guipure laces.
1874	T. Wright and J. Fox		Towels, antimacassars, and bed quilts on the Levers machine.
1876	Henri Hénon		Twelve point Valenciennes.
1920	F. H. Gillespie	165713	Towelings, hessian rugs, tablecloths, blankets.

¹ Messrs. Birkin wished to secure the patent in France but by an extraordinary coincidence found that Pearson and Topham had already done so, none of the patentees knowing that the idea had been conceived in another country.

The production of other fabrics has been attempted from time to time, such as net for gas-mantles.

IMPROVEMENTS AND DISCOVERIES IN DRAFTING

Attention has been drawn to the importance of the draftsman. The following extract from page 13 of special Consular Report No. XXXVII of 1905 emphasizes the point:

His function is the most intricate in the industry; he is called upon to employ the lace machine to execute an object of art. To him belongs the work of exploiting the infinite versatility of the machine, and hence it has been said that he is "the soul of the machine."

Many of the discoveries resulting from work on a "meshing-board" were utilized and became common to the trade, but in some instances they were patented. The following list shows the date, patentee, and patent number of some of the "secrets" which are part of the stock-in-trade of the up-to-date draftsman:

Date	Patentee	Patent no. ¹	Description
1844	Dunncliffe, Crofts & Bagley	10390	The band or tabby-weaving.
1844	William Clark	10163	The scallop.
1849	W. E. Newton	12572	All threads other than bobbin threads, worked from independent beams, instead of from a main warp beam.
1850	Dunncliffe & Bagley	13122	Purls made by twisting the bobbins through the band.
1852	E. Hart	1549	Laces with clips. ²
1855	J. T. Griffith	3176	Overlapping of breadths.
1857	A. V. Newton	1788	Center guimps.
1858			Making two breadths in the same space simultaneously by working the threads of the different breadths on alternate bobbins on different motions.
1859	M. Jacoby	2772	Half gage net and full gage motifs.
1860	M. Jacoby and J. Stones	2343	Valenciennes band front and purls (Vraile Valenciennes).
1861	A. Topham, J. Topham	2778	Dead motions.
1863	W. Clarke	1724	A system of distortion or "turn-back."
1865	J. & J. A. Keenan of Paris	1129	Gloves with fingers, by working in a tubular form on alternate bobbins on the principle of Newton's patent of 1858.
1869	F. R. Ensor	207	Ensor net.
1876	R. Scott	3720	"The tuck."
1879	F. W. Brooksbank, H. Brooksbank, and W. Birks	4195	Double stump bars to produce Ensor net and bobbin fining at the same time.
1883	T. Butler	4923	Four warp or beam threads to a bobbin, making double gage.
1884	J. C. Thornton	2607	Cast off purls.
1885	J. Coxon	4212	"Tucks" without bobbin threads.
1887	I. Elliott	11615	The "Elliott" spot.
1892	W. H. Smith	16758	Dentelle Récamier.
1895	A. P. L. Isaac	23062	Patent spots in veillings.
1895	E. Vial and Co.	23228	Spots in veillings, held by lacers which were burnt out.
1896	R. L. & C. W. Birkin and A. F. Fox	28716	Round hole net for bobbin fining laces.

¹ Copies of the specifications of the patents may be obtained for a small sum from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2 Eng.
² "L'industrie des tulle et dentelles mécaniques." Henri Hénon, page 107.

OTHER TYPES OF LACE MACHINES AND LACELIKE FABRICS

The Mechlin machine produces net with a single row of carriages and has an action similar to that of the Levers machine.

Other machine-made lace fabrics.—There are machine-made fabrics called lace which are made on other types of machinery—the knitting machine and the embroidery machine.

The warp machine, invented by Crane in 1775, is an adaptation of the knitting or hosiery machine. There are three forms of this machine—the fast warp-machine, used for making lace nets, purls, etc.; the steel-bar or fast tatting-machine, used for making lace edgings; and the crochet machine, used for making the so-called "crochet laces." A small number of these machines in use in the United States have Jacquard attachment.

Lace patterns are embroidered on plain net by the schiffli machine. Etched laces or burnt-out laces are made on the schiffli machine, by embroidering a pattern in cotton on a wool or silk cloth, or embroidering a pattern on a cotton cloth, the basic fabric being usually specially treated chemically so as to facilitate its later removal. Etched lace does not become lace until it is finished, by the removal of the basic fabric, the wool or silk cloth by immersion in a mordant bath, and the cotton cloth by subjection to heat.

Plain net is ornamented with designs by printing the pattern in cellulose acetate from print rollers. The lace pattern is impervious to water but can be removed by intense friction, or by a solution of acetic acid.

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DEVELOPMENT OF ENGLISH AND FRENCH LACE INDUSTRIES, 1817-62

The simultaneous development of the English and French lace industries during 50 years, 1817-67, is shown in a table compiled from "The History of Machine Wrought Hosiery and Lace" by W. Felkin, and "L'Industrie des tulles et dentelles mécaniques dans le Pas de Calais, 1815 to 1900", by Henri Hénon. The details shown of the British ownership during the years 1831 and 1836 demonstrate the extent to which the trade was carried on by twisthands who purchased 1 or 2 machines, a system which obtains very largely today. The numbers of machines quoted as being in France refer mainly to those assembled in Calais, St. Pierre, and the surrounding country; in only two instances, the years 1835 and 1862, is the rest of France included. Felkin's book, and also Ferguson's "Histoire de Tulle", quote the number of machines for France, but these are given in round numbers and do not particularize, and as the French lace industry is mainly centered at Calais, the list as given by Mr. Hénon has been adopted for this comparison. There were no bobbinet machines at Calais after 1860. The figures quoted in the following table do not agree with those given on page 125 of chapter II, which comprise Levers machines only. Some particulars of the lace industry in Caudry and Lyons will be found in chapter II.

Simultaneous development of the English and French lace industries; 1817-62

England			France		
Date	Machines	Details	Date	Machines	Details
1817	700	Bobbinet. Patentees held 274.			
1818	970				
1820	1,008		1821	38	
			1824	85	
1826	2,469	Hand Levers, 1,350. Hand rotary, 100. Hand circulars, 1,300. Hand traverse, warp, and pushers, 750. Power machines, 1,000. 1,382 owners. 700 owned 1 machine, 226 owned 2 machines, 181 owned 3 machines, 96 owned 4 machines, 40 owned 5 machines, 1 owned 105 machines, and 1 owned 206.	1828	300	Calais 93, St. Pierre 207.
1829	3,842		1830	429	
1831	4,500				

Simultaneous development of the English and French lace industries, 1817-62—Continued

England			France		
Date	Machines	Details	Date	Machines	Details
1833	5,000	The diminution in numbers is due to the scrapping of old machines and the building of wider machines. Plain net 1,425. Quillings 1,122. Fancy lace 1,000. Unclassified 253. 837 owners. 320 owned 1 machine, 243 owned 2 machines, 102 owned 3 machines, 62 owned 4 machines, 48 owned 5 machines. 3 firms owned 100 and over, each firm; 1 firm owned 200 machines. There were 114 finishing houses.	1834	590	Calais 286, St. Pierre 228, surrounding country 76.
1836	3,800		1835	1,585	Calais, St. Pierre, Douai, Boulogne-sur-Mer, St. Omer, Lille, St. Quentin, Caen, Lyons.
			1837	639	Calais 255, St. Pierre, 234 surrounding country 150. 249 owners.
			1841	853	Calais, and St. Pierre 618, surrounding country 235. 268 owners.
1843	3,200	2,600 at work, 2,300 cotton, 300 silk; 1,500 plain net, 1,100 fancy lace.	1844	893	Calais 210, St. Pierre 469, surrounding country 214. 291 owners.
1845	3,200	2,800 cotton, 400 silk, 1,650 plain net, 1,550 fancy lace.	1851	603	Calais, 96; St. Pierre, 425; surrounding country, 882. 14 warp machines, 3 pushers, 124 bobbinets, 141 fancy circulars, 321 fancy Levers. 143 owners.
1856	6,018	Bobbinet, 3,500; Levers, pushers, traverse warp, circular, 2,518.	1854	606	St. Pierre only (137 owners).
1862	3,952	Birkin's Census, presented to class 24, in the exhibition of 1862, shows 1797 bobbinet machines, 1,588 Levers, 400 warp, 125 traverse warp, and 42 pusher machines. 2,157 made fancy laces, and 1,442 made plain net. 2,149 made silk lace and 1,450 made cotton lace. 353 unlisted.	1860	660	St. Pierre only (475 worked by power, 185 worked by hand).
			1862	12,022	Calais and St. Pierre 790 (Levers 645, circular 92, bobbinet 20, warp 15, pusher 12, mulets 3). Cambrai district, 400, Lyons 732, other places 100.

¹ The whole of France.

EARLY ATTEMPTS TO PRODUCE EXACT IMITATIONS OF HAND-MADE LACE BY MACHINERY

The first patent recorded in the published abridgments of British patents for lace making, knitting, netting, braiding, and plaiting, was issued to William Fanshawe, Gabriel Cox, and Rebecca Croxton on July 30, 1675, no. 182, and was for "Working and waveing of point laces after the manner of point de Venice and point de Espayne." The second patent recorded was issued to Amy Potter on October 4, 1678, no. 204, for—

An invencon for makeing of Flanders colbertine and all other laces of woollen, to be vsed in and about the adorneing or makeing-vpp of dresses and other things for the decent buriall of the dead or otherwise.

In neither case was a specification enrolled, and there is no indication concerning the methods of production which the patents protected.

In 1839 Mr. Oliver, of Basford, constructed an apparatus for making figured open work on a Levers machine. This was said to be effected by substituting two tiers of very large bobbins and carriages for the warp main beam, leaving each thread at liberty as to its tension, each large bobbin and carriage acting as a separate beam. * * * This was an attempt at a mechanical pillow for making patterned lace.

The next attempt to reproduce pillow lace by mechanical means appears to have been made by Barton, of Nottingham, about 1845. He contrived a machine in which the whole of the yarn for making lace was carried on bobbins, and there was no warp. The machine had 5 comb bars and 4 sets of points and required 240 motions to complete one series of meshes; the result was as perfect as can be produced upon the cushion.

M. Audry, one of the jurors of lace at the Exposition Universelle Internationale, held at London in 1851, when pointing out the surprising results achieved by lace-machinery, said:

Who knows if some day the lace machine may not become the true cushion lace maker and its bobbins the real spools worked by mechanical hands and fingers.

M. Noel Prothery patented a machine in 1854 to make Brussels, Alençon lace, etc., with a single set of spindles after the fashion of hand-made pillow lace. M. Planché, of Roubaix, invented a machine to imitate the motions and obtain the results of hand-lace workers by machinery in 1861, and the lace produced on this machine was sold in London as real lace. The report made during the International Exhibition of 1862 speaks of the machine as—

A machine the most remarkable of its kind, producing an article that the most expert judges cannot distinguish from that made by hand.

From a reading of the patented application it is evident that the machine had several jacquards which operated on the warp threads, each of the comb bars, and the pushers of the carriages.

A patent (no. 589) was issued in 1866 to Mrs. Treadwin, by which the buttonhole stitch of needle-point lace, used to cover other threads in Point d'Alençon, Point de Venise, etc., to obtain raised effects, was replaced by effects woven upon the stiffening threads by means of bobbins as in the case of pillow and bobbin laces.

Alfred Masson, of Calais, invented a machine, having seven sets of comb bars, designed to produce shawls or other articles, 80 inches in width, not to be distinguished from those made by hand, either as to ground, cloth work, or ornamentation. Other inventors have been Leon Sival, William Hodgkinson, A. Matitsch, whose machine had no warp, 2 sets of bobbins and 3 comb bars, and J. de V. Machuca y Llorca, who in 1896 patented a machine which he described as a "mechanical pillow, adopted for making real lace such as has heretofore only been made on a pillow" (patent 20787).

ORIGIN AND DEVELOPMENT OF THE BARMEN LACE MACHINE

The art of braiding in its most primitive form dates back to the very dawn of civilization, being as old as, and possibly older than, the art of weaving, inasmuch as the loom, a mechanical invention, is necessary for weaving. It was not until the middle of the eighteenth century that the braiding machine was patented, the first official mention of a machine for making braid being the record of an English

patent, no. 638, granted to Thomas Walford, of Manchester, in 1748. At that date, however, the braid industry was already firmly established in Barmen, Germany, which may be called its birthplace. The first inventor of braid machines in Germany appears to have been a mechanic of Barmen, named Bockmoehl, and the first inventors of braid machines in France were Jacques Vaucanson and Molard.

In dealing with Barmen lace, it is a problem to indicate where braid finishes and lace commences, for Barmen lace is a fancy braid, and it is made on a machine which is an improved braiding machine.

In 1864 a Saxon patent was issued to Louis Hohl, of Annaberg, for a machine which produced lace resembling the two-thread lace of the present time. In 1877 a patent for a similar machine was issued to Hedtmann & Henkels, and in 1880 a patent was issued to the same persons for an arrangement which stopped the machine on the breaking of a thread. August Buesche produced the lace tube, and in 1894 A. E. Henkels perfected the S thorn.

Eugène Malhère, a French engineer and an old pupil of the school of Angers, took out a patent in 1872 for a machine to produce lace of the same texture as that made by hand. Malhère, while studying with the microscope the twisting of the threads of hand-made lace, ascertained, first that in all styles of pillow lace, and in each of their parts, net or flowers, the threads made the same movements, and second that they were alternately reversed. From these observations arose his first conception of the possibility of reproducing these motions mechanically. Living among the hand-lace workers of Calvados, he observed that three regular movements of the fingers of the workers sufficed to produce the twists of most real laces: First, a half turn of the hand to intertwist the yarns, by the rotation of the spindles to the right or to the left; second, a horizontal forward movement to press the twists to the material already made; third, a movement of fixing and withdrawing the pins to keep the finished work intact.

The hand-worker chooses from among the spindles suspended from the cushion those she needs; rolls them sometimes to the right, sometimes to the left to twist and interlace the threads, and plants the pins which must hold firmly the fraction of lace already made, until new twistings fixed in their turn, give her the opportunity of withdrawing the pins previously placed.

Hand-made lace is not constituted, like net or machine-made lace by two distinct groups of threads, warp and weft, but by plaits. The problem was reduced to making neighboring threads twist two and two, from the right or the left according to the needs of the design in such a fashion that the twistings could be effected at will from and in either direction, and to place either thread above or below the other. As a result of this exposition it will be seen that, mechanically, it was necessary to arrange for the moving of the threads required to twist together to place them in connection with each other, and to fix the twistings.

Malhère set himself to try to reproduce these three movements, and to this end he invented and made a fan-shaped machine, reduced to the third of the circumference of a circle, which produced a mechanical imitation of real lace with a perfection not hitherto attained on the Levers machine. This discovery served as a basis for a mechanism which was new, very complicated, and extremely delicate, and threatened to provoke a veritable industrial revolution. The stir it

created was only equaled by that of the discovery of the jacquard, which was largely utilized in the new machine.

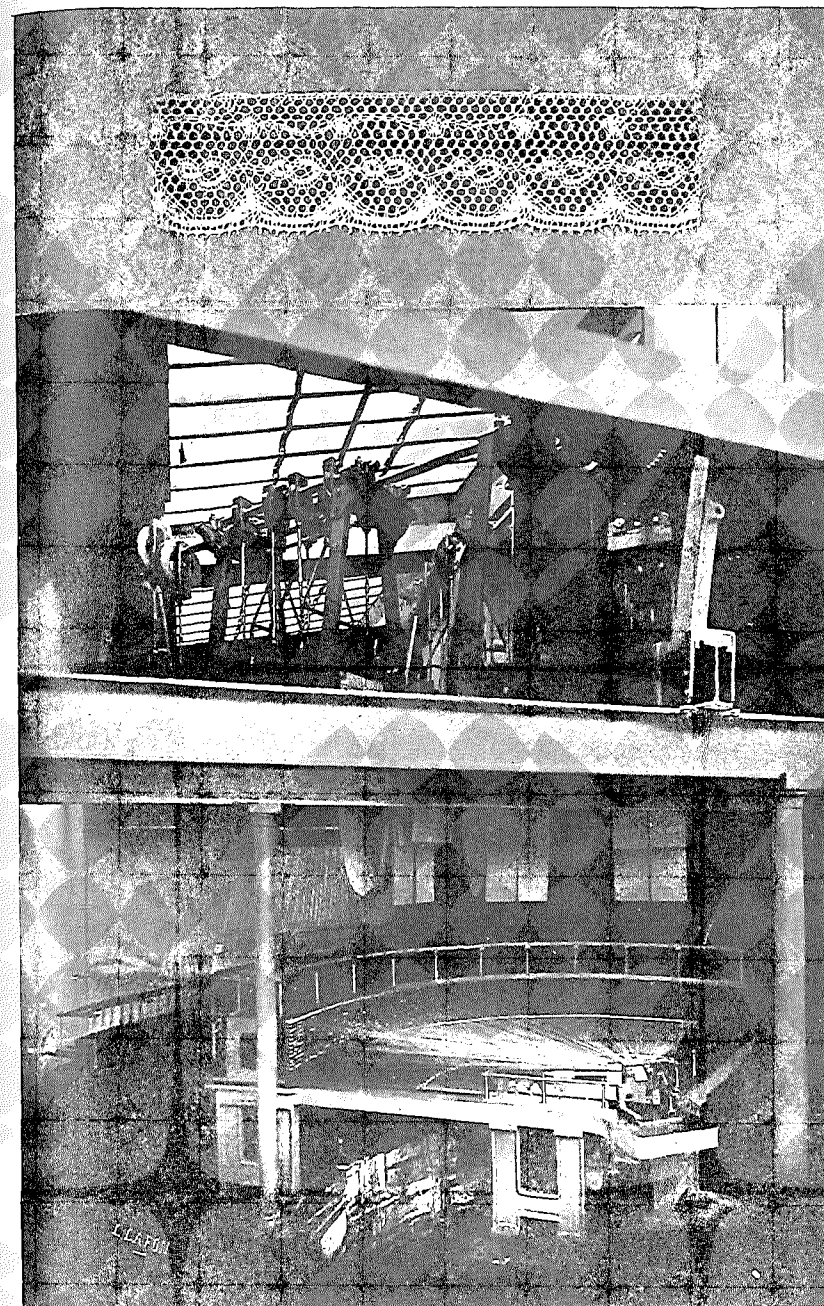
In order to facilitate the revolutions of the threads, collect and move the twistings, and increase the production, the machine was built in a horizontal position. Fundamentally the idea was embodied in an apparatus composed of rotating disks enabling two threads to twist together by half a revolution or a complete one, with means of carrying the threads from disk to disk, all the threads embracing a cylindrical surface which took the place of the hand-worker's cushion, in such a fashion that the threads in coming to work in the center should always have the same length and tension during the execution of the work and should form a horizontal radius at the circular base of the central cylinder before the lace was produced. The different points of the arc of the fan-shaped machine being at equal distances from the central point, where the twistings were collected, the tension of the threads was uniform; this permitted the bobbins to circulate in the interior of the cylindrical surface, without the displacement causing the threads to buckle on themselves or to break.

Having thus the possibility of twisting and untwisting and of changing their positions, a set of Jacquard cards made them move and evolve according to the workings of the pattern. As to the placing of the pins, that part of the work evidently could not be done in the same fashion as by workers who fasten them by hand. An ingenious arrangement of a row of independent points took the place of the pins of the lace maker, and Jacquards overhead governed them; stems moved by the Jacquards came to take the twists each time they were produced and carried them toward the cylinder, which filled the role of the cushion of the hand-lace makers.

The threads carried from right to left or from left to right, twisting in either direction formed between themselves angles whose apexes were bounded by the collecting roller. In order to fix the angles thus formed stems were worked, as required, by the action of a Jacquard, such stems having a horizontal movement backward and forward and alternately ascending and descending. During the twisting of the threads the stems remained behind and beneath them, so as not to interfere with their play; but as soon as the twisting was accomplished the stems were lifted, and the angle formed by the threads was pressed to the roller. The stems remained stationary as long as their intervention was necessary to fix the work. The roller was surrounded by a steel, fan-shaped plate which was furrowed by radiating crevices, and in these crevices the stems worked, the number of stems and crevices being equal. Thus by one Jacquard certain threads were selected and their position arranged, by a second a rotary movement was provided which produced the twists, and by a third a movement of pressure was given which brought each thread to that with which it had to twist, following the requirements of the pattern, and in this fashion the work of the lace-maker's fingers was identically reproduced.

Such is, briefly, the succession of ideas which conducted Malhère, through the examination and unraveling of real lace, to the realization of his machine of plaiting and enlacing; the product of which was found to be exactly identical with the hand-made article.

The machine at first made only a mesh of net, but the principle was found, and it soon furnished such styles as guipure, torchon, Chan-



MÉTIER MALHÈRE OR LA DENTELLIÈRE, 1872 (PRECURSOR OF THE BARMEN LACE MACHINE).

tilly, or Valenciennes. The lace was made four breadths at once, giving laces or insertions of 1 to 2 centimeters in width, perhaps altogether around 8 centimeters (about 3 inches), and the machine made 30 to 35 motions per minute.

Unhappily the inventor, never satisfied with the result of his discovery, lost a great amount of time in new researches, transformations, and modifications in the mechanism. He built an immense machine, which was to make wider lace of a high price. This machine had 1,800 to 2,000 spindles and from 250 to 300 pins or blades. He even made the machine produce different styles of lace at the same time. He would listen neither to the voice of reason nor to good advice, and instead of wisely and intelligently developing an admirable invention, halting at an acquired limit, and building at once a practical machine to produce a particular kind of lace, he tried to conquer needless difficulties and to perform miracles. During this time the capital of the company, formed to exploit the machine, dwindled; and discouraged by repeated sacrifices, made in vain, the directors resolved to place the invention in the hands of a trustee. This was the death blow and the definite finish of the affair.

In 1894 Malhère's sons, who had collaborated with him, conceived the idea of transforming a braiding machine into a machine to make real lace, and patented the invention in France, America, England, Germany, and Italy. Its product is as perfect in quality and style as the hand-made article. The jacquard governed the alteration of position and the rotation of the threads; and the pins at the central cylinder worked with every motion of the machine, whether required or not, by the aid of eccentrics, thus eliminating one of the jacquards.

The patent rights to the finished machine were acquired by Henkels, of Barmen, Germany, and T. I. Birkin, of Nottingham, England. The idea that this machine is of German origin is erroneous and may have originated from the fact that in Germany Malhère's name is sometimes spelled "Mahler."

Bibliography: *La Nature*, March 3, 1881. *L'Industrie des tulles et dentelles mécaniques dans le Pas de Calais, 1815-1900*, pages 261-266, 544-547.

APPENDIXES

APPENDIX A

DECISIONS

Lace is "a fabric of fine threads of linen, silk, or cotton, interwoven in a net, and often ornamented with figures; a delicate tissue of thread." In the absence of testimony that the articles were bought and sold and known to the trade and commerce of the United States only by specific names and not as laces, certain nets and other articles were held to come within the provisions of the Tariff Acts of 1864 and 1883 for laces. (*Morrison v. Miller*, 37 Fed. 82, 83; *Clafin v. Robertson*, 38 Fed. 92, 93; *Sidenberg v. Robertson*, 41 Fed. 763, 765.)

The term "cotton laces" as used in the Tariff Act of 1883 was held, no contrary trade understanding being proved, to include not only laces dealt in by the yard but made-up articles produced originally of lace only in the process of making the completed article. (*Mills v. Robertson*, 147 Fed. 634, 636; *Goldenberg v. United States*, 152 Fed. 658.)

Cases defining lace were reviewed by the Court of Customs and Patent Appeals in *United States v. Max Littwitz, Inc.*, 18 C.C.P.A. 341, 344, and the following language was used:

The Summary of Tariff Information, 1921, page 1156, defines lace as, "lace is ornamental needlework [network] made by intertwining fine threads to form a pattern." We know of no lexicographer who gives any different meaning. The court below seems to have proceeded upon the theory that lace must be made by the yard and by a narrow strip created for the purposes of attachment to some article which it is designed to decorate. We do not understand this to be the definition of the term. There is no distinctive size or shape in which lace must be made. We can conceive of lace which might be made in very large sections, and almost any shape or design. All admit that the samples before us are lace, but it is said, because some of the samples are used for doilies and some for attachment to bed sheets, that, therefore, they are articles and not lace.

We think this is too narrow a construction, and is not justified by the common meaning of the term. In *Sidenberg v. Robertson* (41 Fed. 763), Lacombe, Judge, charging the jury, said, after quoting Webster's definition hereinbefore given, that, in his opinion, such articles as lace collars, lace flounces, lace fichus, lace handkerchiefs, etc., were laces in the usage of common speech. In *United States v. Van Blankensteyn et al.* (91 Fed. 977), certain lace tidies were involved. Townsend, district judge for the Southern District of New York, held that these articles were laces, and called attention to the fact that the importer contended lace must be made by the yard, but that it is not lace when it is made in a curved form or in a square. Again, in *Goldenberg v. United States* (152 Fed. 658), certain cotton-lace collars were again claimed to be not laces, and that lace is a commodity that is bought and sold by the yard. The court held this construction to be too narrow, and followed the *Van Blankensteyn* case. This court, in *Stiner & Son v. United States* (5 Ct. Cust. Appls. 246, T.D. 34428), had before it certain lace imported in continuous lengths, made up by sewing various kinds of lace together. In that case the importer attempted to distinguish between these lace pieces and articles, the importer contending, as he does here, that the word

"article" may be and is often employed in a more narrow sense as related to a complete article, to the exclusion of mere raw material. This court, however, concluded that the Congress in paragraph 350 of the Tariff Act of 1909, the particular statute in question in the case, did not use this term in the restricted sense claimed by the importer, but that laces might be and were, under the statute, articles.

These authorities are in point and appeal to the reason of the court. Surely it was not the Congressional intent to impose a duty of 90 per centum ad valorem upon lace which was made in a narrow strip for edging and 40 per centum upon the same lace made into a circular or oblong form. Paragraph 1430 is, as we have heretofore suggested in other cases, difficult of construction, but no necessity appears for introducing other elements of uncertainty into it by judicial construction which are not warranted by the language used in it.

The Court of Customs and Patent Appeals there held that doilies and sheet frames used, respectively, on tables, dressers, etc., and to attach to bed sheets, made entirely of lace by hand from cotton thread, not cut or made from a lace previously fabricated, and used in the condition imported, were laces within the common acceptance of that term, and were properly dutiable under the provision for "laces * * * and all fabrics and articles composed in any part, however small, of any of the foregoing fabrics or articles" in paragraph 1430, Tariff Act of 1930. This was in effect a decision that lace articles were included in the provisions of paragraph 1430.

The *Littwitz case*, *supra*, was followed by the United States Customs Court in *Bonwit Teller & Co. v. United States* (T.D. 45000), holding knit-wool-lace wearing apparel to be dutiable as laces at the rate of 90 percent ad valorem under the first part of paragraph 1430 of the Tariff Act of 1922. The Customs Court had previously held in *Weil Bros. v. United States* (T.D. 43013) that lace articles were not dutiable under paragraph 1430, as classified by the collector, because the provision for "lace articles" in paragraph 358 of the act of 1913 was omitted from paragraph 1430 of the 1922 act.

The *Littwitz case* was further followed as to file lace articles no part of which ever had any separate existence as lace, but which were made directly from cotton threads into the finished articles. These articles were held dutiable under paragraph 1430 of the Tariff Act of 1922 rather than as manufactures of cotton. (*United States v. Jabara*, 19 C.C.P.A. 76, 79; certiorari denied, 284 U.S. 623.)

Articles which were brought together in single paragraphs in the Tariff Acts of 1913 (par. 358), 1922 (par. 1430), and 1930 (par. 1529), were provided for on the basis of constituent material in two or more paragraphs in previous tariff acts. The most important litigation under the older statutes concerned hat trimmings. The question was whether they were dutiable as trimmings exclusively or chiefly used in the making and ornamentation of hats, etc., or as manufactures of silk or of other specific material. Several cases went to the Supreme Court of the United States and were decided upon the record in each case. Where, on the particular evidence, the articles were adjudged to be trimmings, they were so classified and not as manufactures of the material of which they were made. (*Walker v. Seeberger*, 149 U.S. 541; *Hartranft v. Meyer*, 149 U.S. 544, and other cases.)

Without the limitation "used for making or ornamenting hats, bonnets, and hoods" (which appeared in the Tariff Act of 1883 (par. 448) but not afterward), the word "trimmings" in paragraph 390 of the Tariff Act of 1897 was held to be used in a commercial and not in a descriptive sense. This distinguished *Hartranft v. Meyer*, *supra*, and the other cases. (*Naday v. United States*, 164 Fed. 44.)

Many other questions concerning trimmings have been carried into the courts under the various tariff acts. Articles woven in widths from about 1 to 2½ inches and in pieces of various lengths, with perfectly straight or plain selvaged edges or borders, expressly designed and chiefly used as hatbands for trimming men's hats, were held to be trimmings within paragraph 276 of the Tariff Act of 1894 and not galloons under paragraph 263 of that act. Galloons, described as a variety of hat trimmings, were limited to such as do not exceed 1 inch in width. (*United States v. Graef*, 127 Fed. 688.) Cf. Mill or factory definition, page 84, *supra*.

The Court of Customs and Patent Appeals, distinguishing *Blumenthal v. United States*, 14 Ct. Cust. Appls. 17, held artificial flowers composed in chief value of textile yarns, threads, and filaments, used and capable of being used as trimmings and ornaments on hats, dresses, and other wearing apparel to be dutiable as artificial or ornamental flowers under paragraph 1419 of the 1922 act, rather than as trimmings or ornaments by whatever name known and to whatever use applied, under paragraph 1430, it appearing that in the trade and commerce of the United States at the time of the enactment of the 1922 act the words "trimmings" and "ornaments" were so restricted in meaning and scope as to exclude artificial flowers. The words "trimmings" and "ornaments" as used in trade and commerce were held to be specific things and to not include artificial flowers. Hence the phrase "by whatever name known", as used in paragraph 1430, had no application to artificial flowers, because they were not brought within the class to which the phrase applies. The phrase "by whatever name known" in paragraph 1430 was declared to be intended by the Congress to include such articles only as were recognized in the trade as "trimmings" or "ornaments", and included articles which had a more specific designation, such as motifs, medallions, and rosettes. (*Robinson-Goodman Co. Inc. v. United States*, 17 C.C.P.A. 149, 156.)

Corsets trimmed around the upper border with cotton lace edgings, whose relative value to the corsets was found to be 1 to 2 percent, were held dutiable as wearing apparel made wholly or in part of lace or imitation of lace within paragraph 339 of the Tariff Act of 1897. The trimming with lace was declared a significant feature of the articles, contributing materially to their appearance and doubtless to their salability and price. (*Altman v. United States*, 107 Fed. 15; *Wanamaker v. United States*, 120 Fed. 16.)

In common acceptance a trimming was held to be a fabric attached to a garment or the like for ornamentation, whereas a binding is a narrow strip of goods sewed over the edge of a garment or other material for its protection. The one article is essentially decorative in character, while the other is useful. Yet it cannot be said that either article necessarily loses its nature or its name if in a given case it incidentally serves the same purpose as the other. A trimming may incidentally protect the material to which it is applied and yet remain a trimming; likewise a binding may incidentally ornament the fabric to which it is attached and yet remain a binding. In each case the classification of the article should follow that use to which the article is primarily adapted and commonly applied. (*Massce v. United States*, 3 Ct. Cust. Appls. 470, 472.) Narrow woven fabrics in chief value of cotton, in running lengths and less than 1 inch in width, having a

continuous ornamental design covering less than half the surface along one edge of the article and no design on the remainder of the surface, were there held dutiable as binding rather than trimming under the act of 1897. See also *United States v. Greenwald's Linen Importers*, 17 C.C.P.A. 241, 247, where a linen handkerchief case lined with a white fabric, having a flap, with a silk cord about 33 inches in length attached to the edge of the case and extending over its surface in the form of a semicircle, the part forming the semicircle being about 12 inches in length, and, upon the flap, a cord consisting of 4 loops, 1 encircling a button attached to the body of the case and serving to keep the flap closed, the other 3, with a button attached to the center of the cord ornamentation, being strictly ornamental with no utilitarian purpose, was held dutiable as an article in chief value of linen under paragraph 1021 of the Tariff Act of 1922 rather than as trimming under paragraph 1430 of that act. The fact that one cord was longer than necessary for the protection of the edges, and the extra length was laid upon the surface in a semicircle, and that the other cord, longer than necessary to form a buttonhold, formed three loops that served no useful purpose, was declared not to bring the cords within the term "trimmings" as used in paragraph 1430. The merchandise was also held not to be appliqued or embroidered—applique being defined as ornamentation with a pattern cut out of another color or stuff, applied or transferred to a foundation.

If an importer brings into the country, at the same time, certain parts, which are designed to form, when joined or attached together, a complete article of commerce, and intends to so use them, such parts will be considered for tariff purposes as entireties, even though they be unattached or included in separate packages, and even though they may have a commercial value and be salable separately. Corsets were shipped, each pair in a box and the boxes in cases. Each box was marked with the number and size of the corset in it. Within the case in separate packages, was an equal number of made-up lace trimmings, designed to attach to the corsets each marked with a number and size to correspond to those of one of the corsets. Also, within each case was the same number of ribbon bows. It was shown that, usually, the trimmings were attached to the corsets before sale, but that sometimes they and the corsets were sold separately. The goods were classified as entireties and dutiable at 90 percent ad valorem under paragraph 1430 of the 1922 act. (*Altman v. United States*, 13 Ct. Cust. Appls. 315, 318.)

Principles were also laid down with reference to braid and other articles or fabrics separately provided for. Collars and cuffs composed of braid sewed together and ornamented with cords and threads were held dutiable as "wearing apparel * * * made wholly or in part * * * in imitation of lace" under paragraph 339 of the Tariff Act of 1897. They were declared to be not "lace" nor "imitation lace", as those words were used in trade, nor "made wholly of lace" nor "in part of lace", but articles made in imitation of lace. It was declared unnecessary that articles coming within the provision should be imitation lace as known to the trade. (*United States v. Hesse*, 158 Fed. 407.)

Featherstitch braids, about one-fourth to one-half inch in width, loom woven, of white or colored threads throughout, or of mixed white and variously colored threads of cotton or other vegetable

fiber, and ornamented with raised figures in various designs, some of which had plain and others scalloped or looped edges, were held dutiable under the provision for braids in paragraph 339 of the Tariff Act of 1897 and not as bindings or tapes under paragraph 320. (*United States v. Baruch*, 223 U.S. 191.)

The lace and embroidery paragraph 339 of the Tariff Act of 1897, which act had no specific provision for drawnwork, was held not to include table covers, bureau scarfs, doilies, and similar articles of Japanese linen, ornamented, usually with a single or double border, by drawing out certain of the warp or filling threads and tying and looping them with other threads to form figures or designs, producing openwork effects such as Maltese Cross and spiderweb. In the courts below (T.D. 27644 and T.D. 29017) the contention was made that some of the articles were in part of lace or in imitation of lace or embroidery as provided for in paragraph 339, but the contention as to lace was abandoned in the Circuit Court of Appeals, which held that the articles were dutiable under paragraph 346 of the act of 1897, providing for woven fabrics or articles. (*United States v. Simon*, 169 Fed. 106, 108; certiorari denied, 215 U.S. 610.)

Paragraph 358 of the Tariff Act of 1913, in which laces and articles of lace were for the first time brought together irrespective of materials, was judicially subdivided in *United States v. Snow's United States Sample Express Co.* (6 Ct. Cust. Appls., 120-122), as follows:

(1) Laces, window curtains of lace not specially provided for, and all lace articles of whatever yarns, threads, or filaments composed; (2) handkerchiefs, napkins, wearing apparel, and all other articles or fabrics made wholly or in part of real or imitation lace; (3) embroideries, wearing apparel, handkerchiefs, and all fabrics or articles embroidered, tamboured, appliqued, or scalloped, by hand or machinery, any of the foregoing by whatever name known; (4) edgings, insertings, ruchings, tuckings, flounces, and other similar articles, veils, veilings, nets, nettings, and ornaments; (5) loom-woven braids ornamented in the process of weaving or made by other machinery or by hand not specially provided for; (6) trimmings not specially provided for; (7) woven fabrics or articles with threads omitted, cut, drawn, or punched, having new threads introduced and containing figures or designs, as therein specified; (8) articles made in whole or in part of the foregoing fabrics or articles; (9) declares that all the foregoing of whatever yarns, threads, or filaments composed shall be assessed at 60 percent ad valorem.

In that case shirt bosoms composed of cotton or flax ornamented with loom-woven tuckings chief value were held to be more specifically described in the provision in paragraph 256 of the Tariff Act of 1913 as wearing apparel than by the provision in paragraph 358 of that act for articles made up in part of tuckings. The court said at page 128—

* * * that while Congress intended to impose a high duty upon tuckings, imported as such, it did not intend to impose a like duty upon everything, finished or unfinished, of which tuckings are a part, especially if and when such things were wearing apparel composed wholly or in chief value of the various primary materials within the contemplation of the different wearing apparel paragraphs.

The phrase "by whatever name known" in paragraph 358 was held to have reference only to the articles found in the third paragraph of the above subdivision and not to extend or modify the word "laces" in the first paragraph. Jacquard-figured flax laces chiefly used in making lace curtains were there held dutiable as Jacquard-figured upholstery goods under paragraph 258 of the 1913 act and not as laces under paragraph 358. (*United States v. Snow's United States Sample Express Co.*, 7 Ct. Cust. Appls. 312, 313.)

Jacquard-figured nettings, chiefly used as upholstery goods, were held to be dutiable under the provision in paragraph 258 of the Tariff Act of 1913 for "Jacquard-figured upholstery goods" and not under the provision for "nets, netting" in paragraph 358 of that act. The legislative intent was declared to be to make use, to which a narrowly described class of goods, such as nets and nettings, is devoted, the test of its classification. (*Carter v. United States*, 6 Ct. Cust. Appls. 253-255.) But Jacquard-figured nettings, galloons, edgings, insertings, and valenciennes bandings were held to come within paragraph 358 rather than within the provision in paragraph 258 of the 1913 act for Jacquard-figured manufactures of cotton. Even if the nettings, flouncings, edgings, insertings, and beadings in issue, were not mentioned *eo nomine*, they would, the court declared, be covered by the provision in paragraph 358 for laces, lace articles, and articles or fabrics made wholly or in part of lace. (*Wilson v. United States*, 6 Ct. Cust. Appls. 255, 260, 261.) Hair nets were held dutiable as nets under paragraph 358 of the Tariff Act of 1913. (*Proctor Co. v. United States*, 6 Ct. Cust. Appls. 119.)

Lace curtains, having cotton as the material of chief value, which were made on the Nottingham lace-curtain machine, but which, in addition to having undergone the usual finishing processes of bleaching, dressing, and starching, had been ornamented by a cord design sewed thereon by the use of a machine known as the "Cornelli" or "Cornely", which largely increased their market value, were dutiable under paragraph 339 of the Tariff Act of 1897, as lace curtains not elsewhere provided for, and not under paragraph 340, covering curtains, "finished or unfinished", made on the Nottingham machine. (*Smith v. Read*, 111 Fed. 795.)

The words "made on the Nottingham lace-curtain machine" in paragraph 920 of the Tariff Act of 1922 were held to modify all the articles named in the paragraph, and merchandise not made on such machine was not classifiable thereunder. The effect of the paragraph was declared to except from the operation of paragraph 1430 such articles as were named in both paragraphs if made on such machine, but not otherwise. Consequently, mosquito nets not made on the Nottingham lace-curtain machine were classified as nets under paragraph 1430 and not as nets under paragraph 920. (*Feibleman & Co., Inc. v. United States*, 12 Ct. Cust. Appls. 108, 109.)

Omission from paragraph 150 of the Tariff Act of 1913 of the provision in paragraph 179 of the act of 1909 for laces, embroideries, braids, galloons, trimmings, and ornaments, effected the exclusion from paragraph 150 of such materials made wholly or in chief value of tinsel wire, lame, bullions, or metal threads. Certain narrow woven fabrics in chief value of tinsel wire bullion or metal threads were held to come within paragraph 358. In its common meaning "trimmings" was held to be less specific than ribbons, galloons, gimps, braids, or bands, and straight selvage was declared characteristic of ribbons. A thing may be a trimming and at the same time a ribbon, galloon, gimp, braid, or band, and from that it follows that unless some special trade meaning has attached itself to the terms considered, ribbons, galloons, gimps, braids, and bands must be regarded as more specific designations than trimmings. A tariff provision which provides for such articles by name must, therefore, for classification purposes be preferred to a provision for trimmings

not specially provided for. Paragraph 358 was held comprehensive enough to include all laces, embroideries, galloons, ornaments, and braids and trimmings, whatever might be the yarns, threads, or filaments of which they were composed. (*Siegman v. United States*, 7 Ct. Cust. Appls. 195, 202.) The expression "yarns, threads, or filaments" was held to cover only such materials as are generally known to be for knitting, weaving, or sewing. (*United States v. Veit*, 8 Ct. Cust. Appls. 290, 296, holding trimmings in chief value of lame or bullions not to be classifiable under par. 150, act of 1913, nor as trimmings under par. 358, but as articles composed in chief value of metal under par. 167. Like decision was made in *United States v. Borgfeldt & Co.*, 14 Ct. Cust. Appls. 240, as to rugs of goat-hair felt, ornamented with embroidered designs and having margin fibers drawn out into a fringe.)

While the first part of paragraph 1430 of the act of 1922 provided for flouncings *eo nomine* there was no provision for embroideries in the form of flouncings, nor any provision for "flouncings, embroidered or otherwise." The embroidery design or pattern was produced in the manufacturing process, the net which appeared to have been in a way the base of the finished flouncing, was not embroidered before the process of manufacture, and no embroidering was added after the flouncing was brought to its finished stage as imported. The article was held to come within the second rather than the first part of paragraph 1430. (*United States v. F. A. Ramig Co.*, 17 C.C.P.A. 365, 367.)

Two rates of duty in paragraph 1430 of the Tariff Act of 1922 led to litigation with respect to articles having materials coming within both brackets. The matter first came before the Court of Customs (now Customs and Patent) Appeals upon embroidered flouncings, which were held dutiable at the 75 percent rate imposed on embroidered fabrics and articles. Flouncings were declared *eo nomine* provided for in the first part of paragraph 1430 but not embroideries in the form of flouncings, nor "flouncings embroidered." Embroidered flouncings or embroideries in the form of flouncings were held to be excluded from the first part of the paragraph and were held dutiable under the second part of the paragraph at 75 percent ad valorem. (*United States v. Smith*, 12 Ct. Cust. Appls. 384, 387-389.) The *Smith* case was adhered to in litigation involving burses, which were classified by the collector as fabrics or articles in part of trimmings, galloons or braid, dutiable at the 90 percent rate imposed in paragraph 1430. The importer's claim that the burses were fabrics and articles embroidered and dutiable at the 75 percent rate was sustained. The court said—

The first part of paragraph 1430 provides among other things for *embroideries capable of conversion into burnt-out laces and for nets and nettings embroidered*. Congress having expressly named the particular embroideries and embroidered fabrics upon which it intended to impose a duty of 90 per centum ad valorem, it must be assumed, under the rule of interpretation just cited (*expressio unius est exclusio alterius*) and nothing to the contrary appearing, that it was not the legislative purpose to subject to the 90 percent rate any embroideries or embroidered articles other than those actually specified either *eo nomine* or under designations which necessarily imply an embroidery or an embroidered fabric or article. *Smith v. United States*, 12 Ct. Cust. Appls. 384, 387, 388.

Pustet v. United States (13 Ct. Cust. Appls. 530, 532), followed in *Glembly's Sons Co., Inc. v. United States* (13 Ct. Cust. Appls. 533), as to a silk piano cover and a velvet table cover made in part of trim-

ming and embroidered, and classified by the collector as fabrics and articles composed in part of trimming dutiable at the 90 percent rate.

Those decisions were distinguished in a case (*United States v. Field*, 15 Ct. Cust. Appls. 254) involving merchandise reported by the appraiser upon one of two protests as follows: "The merchandise consists of curtains of net composed in chief value of yarn, threads, filaments, or beads. It is embroidered. It is also composed in part of lace, net, or one of the other materials named in the first division of paragraph 1430." As to the other protests the appraiser reported that "The merchandise consists of curtains composed of net, tamboured." All the merchandise was classified under the first part of paragraph 1430 at 90 percent ad valorem. The importer claimed it to be dutiable under the second part at the 75 percent rate. The Customs Court sustained the protest and the Court of Customs Appeals affirmed in part and reversed in part. The appraiser's report as to the merchandise covered by the first protest was interpreted to mean that the curtains described therein were embroidered, and not that the component material was embroidered before the curtains were made therefrom. The *Smith case*, *supra*, was applied to them in favor of the importer. The curtains and not the net were declared to be embroidered. His report on the second protest was likewise interpreted to mean that the component material of the curtains was not tamboured before the curtains were made but that the curtains were tamboured. There was no controversy, it was declared, about this nor that the curtains were made of nets or nettings. As to them the judgment of the Customs Court was reversed. The legislative distinction in prior tariff acts between articles embroidered and articles tamboured was, the court said, carried into paragraph 1430. There was, therefore, the court said (p. 258), no room for the application of the rule of *expressio unius est exclusio alterius* which in the *Smith case*, *supra*, was declared to require the exclusion of embroidered flouncings from the first part of the paragraph, "because there is no specific reference whatever to tambouring or tamboured articles in the first part thereof." The court said in part (p. 259)—

These tamboured lace curtains are, therefore, by force of the *eo nomine* rule classifiable under the first part of paragraph 1430, and the judgment below as to them cannot be upheld.

By naming lace window curtains in the first part of the paragraph and omitting to use any language indicating that the *eo nomine* rule was not applicable, Congress indicated an intent that such curtains should pay the higher rate provided in the paragraph. It could hardly have meant that such curtains, if tamboured, should pay a less rate because they were tamboured. By classifying them under (a) a result is reached which is in accord with the established policy of tariff legislation that, generally speaking, the more elaborate, advanced, and expensive articles of the same class are subjected to a higher rate of duty if two different rates are provided therefor. A similar intent is manifested in paragraph 1460 of the act which provides that if two or more rates of duty are applicable to an imported article, the higher rate shall prevail. So in this case, if these tamboured lace window curtains were described with equal specificity in (a) and (b) the higher rate would govern.

We think these lace window curtains tamboured are *eo nomine* provided for in (a) and the judgment below as to them must be reversed.

Paragraph 1430 is exceedingly difficult of comprehension and application. We have tried to apply such rules of interpretation thereto as seem pertinent with the purpose of giving force, so far as may be, to such congressional intent as can be discovered therein, in view of its seemingly inconsistent and conflicting provisions. It clearly merits legislative clarification.

The *Field case*, *supra*, was considered in *United States v. Goldfrank & Co.*, 16 Ct. Cust. Appls. 340, 345, with reference to certain ladies' embroidered collars made of embroidered netting of double and single thickness, cut into the required dimension and introduced into an embroidery machine which produces the finished article in the piece except for the cutting apart and the cutting away of one thickness of netting in case of double thickness. The collector's classification as embroidered net and embroideries on net under paragraph 1430, at the 90 percent rate, was sustained, and the articles were held not dutiable at the 75 percent rate as "fabrics and articles embroidered" as contended by the importer. The court said—

In the case at bar the articles imported are collars made of netting, embroidered. Collars not being *eo nomine* designated in the first duty provision of the paragraph, the case is not parallel to *United States v. Field*, *supra*, and the goods were properly classified by the collector under the 90 per centum provision of the paragraph. Considerable argument is offered to demonstrate that the goods in question are not articles made of "nets and nettings, embroidered."

The theory advanced is that the imported collars were manufactured of several component materials, among which was netting, unembroidered; that the embroidery was placed upon the netting concurrently with the making of the collars and, hence, the netting never was embroidered. But as we view the case this is immaterial. If the collars were made, in part, of plain netting, this answers every requirement of the statute which specifies "embroidered or otherwise," that is, embroidered or not, as we have held in *United States v. Vandegrift*, 4 Ct. Cust. Appls. 226; T.D. 33438, and *United States v. Chesterton*, 15 Ct. Cust. Appls. 175; T.D. 42232.

Nonembroidered fabric lamp shades which are ornamented with beads and composed in part of nonembroidered trimmings, galloons, and ornaments but not in part of nets or nettings or burnt-out laces were held dutiable at 90 percent ad valorem under paragraph 1430 as articles composed in part of trimmings or ornaments and not at the 75 percent rate as articles ornamented with beads. The highest rate provision in paragraph 1430 was applied. The provision in paragraph 1430 for "galloons * * * trimmings * * * ornaments * * *" and all fabrics and articles composed in any part, however small, of any of the foregoing fabrics or articles," and for "all fabrics and articles * * * ornamented with beads," were declared equally specific, the words "however small" adding nothing to the specificity of the first provision. The foregoing cases were distinguished. (*United States v. American Shipping Co.*, 15 Ct. Cust. Appls. 249, 252.) Like construction was applied to handkerchiefs from which threads had been drawn and with threads introduced after weaving to finish or ornament the openwork, not including straight hemstitching, said handkerchiefs being made in part of lace. (*United States v. Tan*, 15 Ct. Cust. Appls. 252.)

Articles wholly or in chief value of spangles, but not ornamented with them were held dutiable under paragraph 1403; articles ornamented with them were held dutiable under paragraph 1430. (*United States v. Heller*, 13 Ct. Cust. Appls. 227.)

Wilton rugs made in part of fringe that derived its form by assembling threads or yarns and interweaving them with the threads or yarns of the rugs in such a manner as to produce a fringe along either end of the rugs were held to be dutiable under the provision for Wilton rugs in paragraph 1117 of the 1922 act and not under paragraph 1430 inasmuch as the fringe appearing upon the rugs was not a separate and distinct entity at the time it became part of the rugs. (*Hemance v. United States*, T.D. 41273, G.A. 9076.)

Alençon lace, an article produced by embellishing shadow lace by means of stitching, was held to be an embroidery, not specially provided for, under the second part of paragraph 1430, Tariff Act of 1922, even though its production is a finishing operation for a particular type of lace. Where stitching is done upon a fabric not for the purpose of utility but for the purpose of ornamenting or embellishing the design of an already completed fabric, as in the case at bar, such stitching is to be regarded as an embroidery. The cord effect produced by the stitching, known as lock-stitching, upon the design, did not render it appliqué. The use of the language "by whatever name known", in paragraph 1430, prevented the application of the rule of commercial designation to the issue at bar, and the refusal of the trial court to admit certain testimony intended "to show the commercial distinction between stitches outlining a pattern and embroidery" was not error. (*United States v. Caesar*, 18 C.C.P.A. 106-110, and cases therein cited.)

In *United States v. Case* (20 C.C.P.A. 1) prior decisions were reviewed in determining the tariff classification of articles described as follows:

Exhibit 1.—Bright colored fabric upon which certain figures were embroidered with metal and silk threads; used for trimming garments.

Exhibit 2.—Princess lace made upon a foundation of net upon which had been sewed braid, certain characters in the form of leaves and dots, and other figures known as Shiffl wheels, Shiffl rings, and Shiffl spiders.

Exhibit 3.—Princess lace, some having burnt-out portions and all containing embroidery stitching of the same character as in exhibit 2, the dots, however, not being made by embroidering but first made and then sewed to the netting.

Exhibit 4.—Princess lace of the same character as exhibits 2 and 3 but with more burnt-out portions than other exhibits, with more elaborate embroidered figures in silk or artificial silk.

The court held that if the articles were lace without the embroidery contained thereon being *eo nomine* provided for in the first part of paragraph 1430, they were dutiable, when embroidered, under the second part of said paragraph, otherwise not. Upon further consideration of the issue presented, on rehearing (*United States v. Case*, 20 C.C.P.A. 185), it was held that the Princess laces represented by exhibits 3 and 4 were dutiable under the second part of paragraph 1430 at 75 percent ad valorem. Laces, both finished and unfinished, being provided for in the first part of 1430, the contention of the Government that the laces represented by exhibits 3 and 4 owed their existence solely to the embroidered designs was declared to be immaterial if the material upon which the embroidery was placed was not provided for in the first part of the paragraph as laces, it was provided for as unfinished laces.

Wool braids made on a guipeuse or gimping machine were held dutiable under paragraph 1119 of the Tariff Act of 1922 as manufactures of wool rather than as braids under paragraph 1430, not being made by any process named in paragraph 1430 (*Gage v. United States*, T.D. 43818).

Corsets with lacings in chief value of silk or cotton, according to the material of the corsets with which they were to be used, made of braid with metal tips, were held dutiable as articles in part of braid under paragraph 1430 rather than as wearing apparel in chief value of silk or cotton. The fact that a component part of a manufactured article may be in itself a manufacture is not considered a limitation

when ascertaining what the component materials of the manufactured articles may be. (*United States v. Marshall Field & Co.*, 17 Ct. Cust. Appls. 1. See also *Same v. Same*, id., 287, 353.)

Braids used for making women's hats and composed of products of cellulose, not compounded, were held dutiable under paragraph 1430 rather than paragraph 30 of the 1922 act which was applicable to a compound (*Olivier Straw Goods Corp. v. United States*, 15 Ct. Cust. Appls. 22).

Cotton cloth in the piece having plaits or tucks produced during the process of weaving the cloth was held to be dutiable under paragraph 1430 of the Tariff Act of 1922 rather than as manufactures of cotton under paragraph 921 since cotton cloth of such character was to be used in making tucked shirt bosoms and paragraph 1430 included fabrics tucked during the process of weaving. The court said the folds in the cloth were not made for the purpose of shortening the fabric but for the purposes of ornamentation, and whether such tuckings were woven during the making of the cloth or stitched or sewed in after the cloth was made the same result was accomplished and they came within the common meaning of the term "tuckings" (*United States v. Shapiro*, 15 Ct. Cust. Appls. 60, 62).

In the latest (to July 1, 1934) decision of the Court of Customs and Patent Appeals under the lace provisions of paragraph 1430 of the Tariff Act of 1930, namely, *United States v. Jabara* (22 C.C.P.A., T.D. 47065), articles stipulated as ecru filet bedspread, ecru filet square cover, etc., were made by hand as follows: Pursuant to the design, a mesh or net foundation is made, usually by special order, and is of the size and shape required for the particular articles which are to be made. This mesh or net foundation is never used for any purpose other than the making of filet-lace articles of some description. This mesh or net is then stretched upon a frame, and the worker, with a needle and thread, reproduces by hand upon the mesh foundation the design previously drawn upon paper, following the scale of the design. This work is done with what is termed a "darning" stitch. After the filling-in process has been completed, another design is worked upon the edge of the articles by needle and thread, by what is known as a "buttonhole" stitch. After this is completed, the mesh or net which may be outside of the line of the "buttonhole" stitch is cut away, leaving the article with an irregularly shaped edge. In this finished condition all of the merchandise was imported, with the exception of the articles represented by exhibit 4, which articles have said "buttonhole" stitch on one edge only, the other three sides being finished with what is termed a "run edge."

The importer contended that the foundation mesh or net is unfinished lace, and that the darning and buttonhole stitches constitute embroidery upon said unfinished lace; that if it should be held that said foundation mesh is not unfinished lace, then said material, after the darning stitches have been applied, became a lace article, and the buttonhole stitch placed thereon afterward makes the article an embroidered article; that if it should be held that the involved articles are not finished laces embroidered, they should be held to be unfinished lace articles embroidered.

Counsel for the Government claimed that the articles were properly dutiable as lace articles not embroidered, as classified by the collector.

With respect to the buttonhole stitching the Customs Court (T.D. 46574) said:

* * * After this "darning stitch" or filling-in process is completed, which, as we have held, produces an unfinished lace, there is a design worked on the edges of this merchandise by means of a needle and thread, which is known as a "buttonhole stitch." An examination of the record in this case, including an inspection of the samples, is convincing that this "buttonhole stitch" on the edges of the samples is embroidery. It answers all the definitions of embroidery laid down by this Court and the Court of Customs and Patent Appeals in all the recently decided cases on embroidery. * * *

Counsel for the defendant, in his reply brief filed herein, contends that the embroidery on the edges of the articles in question is not embroidery and that it is nothing more than a finishing process to keep the edges from unknotting and unravelling. Aside from the testimony of plaintiffs' witnesses that these edges are embroidered, and that the embroidery is not placed thereon for the purpose of keeping the edges from unknotting and unravelling, an examination of the samples in evidence conclusively establishes that with this embroidery removed from these edges they are still fast and complete edges in and of themselves, and that it is not necessary that this embroidery should be added to keep the edges from unknotting or unravelling.

The Court of Customs and Patent Appeals held that the buttonhole stitching is embroidery and the articles involved are embroidered lace articles dutiable at the 75 percent rate. In view of that decision, the question whether the mesh or net foundation is unfinished lace was not considered. The court followed its decision in *United States v. Field* (18 C.C.P.A. 469), that certain lace panels were curtains composed of embroidered net and properly dutiable as embroidered articles at 75 percent ad valorem under paragraph 1430 rather than at the 90 percent rate as lace articles.

Under the Tariff Act of 1930, a wool dress suit, not knit or crocheted, in small part of braid, was held dutiable at 90 percent under paragraph 1529 (a), the omission from that paragraph of the words "however small", which appeared in paragraph 1430 of the 1922 act, being held not to change the scope of the paragraph (Ab. 21322); cotton braid shoe laces with metal tips, the braids being made on a braiding machine, were held, whether or not ornamented, dutiable at 90 percent under paragraph 1529 (a) (Ab. 21344); a French flag, the sole property of a French society, to be carried in processions with the American flag, was held dutiable as in part of fringe and not exempt from duty under paragraph 1773 for regalia (Ab. 21588), and plain finished cotton nets made on a Nottingham lace machine, were held dutiable under paragraph 920, rather than under 1529 (Ab. 22345).

Paragraph 1529 (a) was held not to cover all articles made on a braiding machine and excludes wool scarfs made on a braiding machine but not in any part of braid (Ab. 26963).

Burnt-out laces, cotton chief value, made on an embroidery machine, were held dutiable under paragraph 923, as manufactures of cotton, rather than at 90 percent, under paragraph 1529 (a), as laces. To come under paragraph 1529, laces must be made by hand or on a lace, net, knitting, or braiding machine. Congress having omitted from paragraph 1529, the provision for "burnt-out laces" that was in paragraph 1430 of the 1922 act, evidenced an intent to exclude such laces from paragraph 1529. (*Marshall Field & Co. v. United States*, T.D. 46939; rehearing denied, Ab. 27921.)

APPENDIX B

List of lace manufacturers in the United States and number of machines owned by each, November 1933

State	Town	Firm	Nottingham lace curtain machines	Lever lace machines	Bobbinet machines	Mechan machines	Barmen lace machines	
Connecticut	Bridgeport	American Fabrics Co.		18			525	
	Middletown	Arthur Smith, Inc.		5				
	do	Colonial Lace Manufacturing Co.		7				
	South Norwalk	Connecticut Lace Works, Inc.		26				
Illinois	Rockville	Walter Draycott	29	14				
	Zion	Zion Lace Industries		2				
	North Attleboro	Oldtown Lace Co.		31				
	Ohio	Elyria	American Lace Manufacturing Co.					
New Jersey	Flemington	Readington Textile Co.		6				
	Hightstown	Princeton Lace Works		9				
	Paterson	William Dalby		5				
	Do	Van Rsaite Co.	2	10	8	4		
New York	Do	Sherwood Lace Co.		2				
	Somerville	Redfern Lace Works		24				
	Three Bridges	R. C. Hicks		4				
	Gouverneur	International Lace Co.	18					
New York	Kingston	United States Lace Mills	11					
	Mount Vernon	Lever Lace Co.		3		16		
	Newburgh	American Bobbinet Co.		4				
	New York	Carver Lace Co.		21	15			
Pennsylvania	Do	Liberty Lace & Netting Works.						
	Do	Martin Henkel		7				
	Patchogue	Patchogue-Plymouth Mills	49	8				
	Port Jefferson	Thomas Wilson & Co.		22				
Pennsylvania	Chester	Chester Lace Mills	17					
	Columbia	Columbia Lace Mills	15					
	Lehighton	Pennsylvania Lace Co.		11		10		
	Philadelphia	Bromley Lace Co.	76	27			156	
Rhode Island	Do	Fine Arts Lace Co.		42				
	Do	North American Lace Co.	61					
	Do	Quaker Lace Co.	104				274	
	Reading	Narrow Fabrics Co.	36					
Rhode Island	Scranton	Scranton Lace Co.	70					
	Wilkes-Barre	Wilkes-Barre Lace Manufacturing Co.		23				
	Do	Wyoming Valley Lace Mills.			30			
	Alton	Richmond Lace Works		6				
Rhode Island	Bristol	Bristol Lace Co.		10		12	6	
	Central Falls	United Nets Corporation		7				
	Do	Central Lace Co.		7				
	Pawtucket	American Textile Co.		65				
Rhode Island	Do	Bodell Lace Co.		28				
	Do	New England Lace Mills		25				
	Do	Seekonk Lace Co.		3				
	Do	Stern Lace Co.		14				
Rhode Island	Washington	Beatti & Knight		3				
	Do	Jack Beatti		3				
	Do	P. H. Bestwick		4				
	Do	Washington Lace Co.		43				
Rhode Island	West Barrington	Rhode Island Lace Works		17				
	West Warwick	Phenix Lace Mills		5				
	Do	Riverpoint Lace Works		12				
	Do	Warwick Lace Works						
Total				511	590	61	10	955

APPENDIX C

WAGE LISTS

The following official wage lists are in the files of the Commission.

UNITED STATES

1. Revised list of prices for lace goods made on the curtain machine as amended and agreed to by the manufacturers and the Chartered Society of Amalgamated Lace Operatives of America, 1933.
2. Schedules of prices to be paid for various classes of goods in the Levers Branch of the trade known as the "1894 Nottingham card", in American currency, with increases added as of May 12, 1917.
3. Plain net card, 1923.

GREAT BRITAIN

4. Revised list of prices for all classes of goods made on lace-curtain machines, Nottingham, 1931.
5. Midland Counties Lace Manufacturers' Association, England. Wage schedule for twisthands. 1932.
6. The Midland Counties Lace Manufacturers' Association, England. Wages for auxiliary workers. 1920.
7. The Midland Counties Lace Manufacturers' Association, England. Corrected circular, re wage revision. 1922.
8. The Lace Finishing Trade Board. Minimum rate of wages. 1922.
9. The British Plain Net Manufacturers' Association, plain net price book. 1922.

FRANCE

10. Wages in the Calais lace and net industry and the system employed to adjust them to variations in living cost. 1920.
11. Tarif de Façon du Tulle armure, Maline, Bobin et Filet-Cheveux. Lyon, France, 1919.