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DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF MANUFACTURES
JOHN M. CARSON, Chief

SWISS EMBROIDERY AND LACE INDUSTRY

By

W. A. GRAHAM CLARK

Special Agent of the Department of Commerce and Labor

WITH ADDITIO' AL REPORTS FROM CONSULAR
OFFICERS IN OTHER COUNTRIES



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LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF MANUFACTURES,
Washington, February 5, 1908.

SIR: I have the honor to submit herewith a report from Special Agent W. A. Graham Clark on the manufacture of cotton goods in Switzerland, and especially cotton laces and embroideries. Methods of manufacture, wages paid, and other matters incidental to cost of production are set forth in the report. The total value of cotton laces and embroideries imported into the United States during the calendar year was \$41,443,363, of which amount \$16,800,000 was received from Switzerland, which is equal to about 40 per cent of the whole. These figures do not include the value of silk ribbons, laces, and embroideries, aggregating \$8,502,694 in the last calendar year, about one-half of which came from Switzerland.

The production of cotton embroideries of every description is an important and progressive industry in the United States, and efforts are being made by American manufacturers to produce fabrics that will take the place of many of those now imported. To assist in promoting this object, the report of Special Agent Clark was prepared.

Lace and embroidery factories in many countries find that their best market is in the United States. For this reason descriptions of how the industry is carried on in Germany, France, Belgium, England, and India will also be of interest. Reports on the trade are therefore added from consular officers, making a rather comprehensive review of the lace and embroidery output from the leading centers of world production.

Respectfully,

JOHN M. CARSON,
Chief of Bureau.

TO HON. OSCAR S. STRAUS,
Secretary of Commerce and Labor.

SWISS EMBROIDERY AND LACE INDUSTRY.

Switzerland, with only 15,469 square miles of land and some 3,500,000 people, had a total foreign trade in 1906 of \$855,770,382, made up of \$465,739,730 imports and \$390,030,652 exports. The imports are mainly foodstuffs and raw materials, while the exports are principally manufactured products. The largest single item in the export list is silk goods, while the second largest is cotton goods, and for 1907 it is probable that cotton goods will rank first.

In 1906 Switzerland imported cotton and cotton manufactures to the value of \$21,419,273, clothed its own people, and exported cotton manufactures to the value of \$40,928,053. The total Swiss figures for cotton and cotton manufactures show that \$32,900,670 came in over the border and that \$52,409,450 went out over the border, but of this \$11,481,397 represents the value of cotton manufactures that simply passed through the country, and as it did not in any way affect the actual Swiss trade it may be disregarded.

The average value of the raw cotton imported in 1906 was 14.55 cents a pound. The average value of all manufactures of cotton exported reached \$1.15 a pound, while the average value of the embroideries and laces alone reached \$2.07 a pound. The "raw material" used in Swiss cotton manufacturing includes not only cotton, but yarns, thread, and cloth; but after taking these into consideration Switzerland still holds the record for the greatest difference between the value of cotton imported and cotton exported. Three-fourths of the cotton exports consist of embroidery and laces.

ST. GALL THE EMBROIDERY CENTER OF THE WORLD.

Cotton mills in Switzerland center around Zurich, but have not enjoyed any great measure of prosperity and show no tendency to increase. Embroidery manufacturing, however, which is centered around St. Gall, in eastern Switzerland, has been on a great boom for several years, and its increase has been wonderful. Its exports to the United States alone were in 1906 double those of 1900. Its sales to other countries also show great gains, and St. Gall is now the embroidery center of the world. Just at present the business is experiencing a sharp setback, due to the money crisis in New York, but this

is only temporary. There are in Switzerland some 6,000 power machines and 16,000 hand machines for making embroidery. The great bulk of these are centered around St. Gall, and their production is exported from that point. Around St. Gall are also situated the machine builders, the bleacheries, and the large number of small industries allied with this line of manufacturing.

As yet there are only 616 embroidery machines in the United States, and the St. Gall manufacturers laugh at the idea of America being able to compete with Switzerland in this industry. It seems to be a fact, however, that on cheap handkerchiefs and some other articles, especially novelties that have to be put on the market quickly to meet a sudden demand, the United States is already getting the home market, and in time may be able to compete on broader lines. What has been done in watchmaking may yet be done in embroidery making. In St. Gall itself the industry in a great measure owes its development to the application of American business methods, and the largest and most up-to-date factories are those owned and controlled by Americans.

SWITZERLAND'S IMPORTANT ADVANTAGES.

The main advantages of Switzerland over the United States seem to be, first, the inherited aptitude of the St. Gall people for designing and manufacturing embroideries, which is fostered and aided by the concentration of the business in one place where everybody thinks and dreams about nothing but embroidery; second, facilities for obtaining, at reasonable prices, high-grade yarns and cloths; third, extra fine water for bleaching; fourth, cheaper first cost of machinery and building; fifth, cheap labor.

The first point, in regard to the "embroidery atmosphere," about which much is sometimes made, affects mainly the designers and managers. The stitcher is a skilled worker, but it is work that any intelligent man can soon learn and calls for little headwork. As for the girl overseer, the shuttle filler, the sewing-machine repairer, etc., a large number are Italian girls who have been imported and trained after arrival. In regard to the second point, high-grade muslins and cambrics and fine Egyptian yarns, such as are used on fine embroideries, can be obtained in St. Gall from Zurich or Manchester much cheaper than would be possible in New Jersey. This fact tends for the present to limit the American embroidery factories to the cheaper grades on which the Swiss have not such an advantage in regard to the foundation material. The Swiss bleaching is exceptionally fine, which is due to the very soft water obtained from Lake Constance and other sources, and also, it is claimed, to secret bleaching processes. As no embroidery machinery is made in the United States the machines will cost the American, including freight, duty, and installing,

about twice what they will the Swiss, and the latter also gets his building somewhat cheaper.

LOW WAGES OF OPERATIVES—HAND AND POWER MACHINES.

The greatest advantage of the Swiss manufacturer is undoubtedly his cheaper labor. For instance, the operatives employed on the actual work of embroidering or "stitching," as it is technically known, are the stitcher, the girl overseer (watcher would be a better word), and the shuttle filler. The stitcher in St. Gall will make, say, \$8 to \$12 a week, in New Jersey \$18 to \$30; the girl overseer in St. Gall will be paid from 38 to 57 cents a day, in New Jersey from 85 cents to \$1.35; the shuttle filler in St. Gall will be paid 38 cents a day, in New Jersey 75 cents. This is quite a difference and is especially important on fine embroideries, where the labor cost is really the controlling factor.

The power machines are referred to as shuttle or schifflli machines. "Schifflli," from the German word for boat, refers to the resemblance in shape to boats of the small shuttles used. In Switzerland there are more hand machines than power machines, but the larger portion of the power machines are grouped in factories, while the hand machines are in the workers' homes and are dependent on overflow orders from the factories. The hand machines, therefore, do not run as continuously as the power machines, and when times of slackness arise, as at present, they are the first to feel the depression. For the last few years there has been work for all and hand-machine workers have made good wages. At present a great number of hand looms are stopped and others are being run at starvation prices. The hand machines used around St. Gall are practically all $4\frac{1}{2}$ yards long, while the bulk of the schifflli machines are $6\frac{3}{4}$ yards long. There are also a large number of 10-yard schifflli machines. These are the longest single machines, but recently there has been introduced from Plauen, Germany, a double machine—that is, $13\frac{1}{2}$ yards long. This is two $6\frac{3}{4}$ -yard machines coupled together and worked by one pantograph. It is more complicated than the ordinary Swiss single machine, and can not be run quite as fast, but as it makes double the amount of embroidery at a time and only uses one stitcher, one girl overseer, and two shuttle fillers it reduces the cost of stitching and seems to be a success.

EFFECTS OF BUSINESS DEPRESSION.

Swiss embroideries are now being sold in the United States at prices, due to lowered stitch rate, that must tend to seriously affect the American industry in all grades. Most of the big factories themselves are now running short time, three to four days a week, or else six hours a day, and wages have also been reduced. There

have been few cancellations of orders from the United States, but there is no new buying. The manufacturers are very gloomy over the outlook, but the larger mills have their previous big profits to fall back upon and are quietly taking advantage of the slackness to make needed alterations in their plants, to tighten the reins of discipline, and, where possible, to reduce wages and effect other economies.

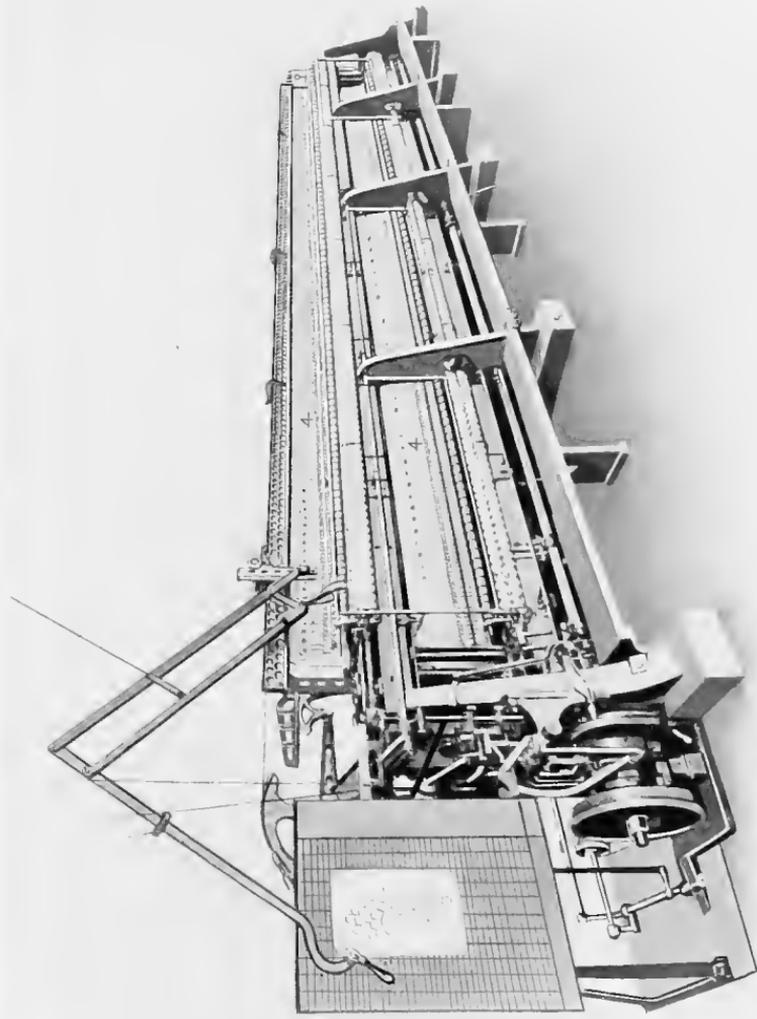
The business was so prosperous in 1904, 1905, 1906, and the first half of 1907 that there was a great increase in the number of machines, and hence in the demand for labor. Wages in consequence rose steadily, and manufacturers claim that they went up out of proportion, but they now find it hard to force them down to the old level. If the present depression continues much longer, wages will weaken rapidly, as there is now not enough work to go round and large numbers are being thrown out of employment.

The "stitch rate" rose correspondingly during the flush years, but with the slackening of demand since October this has dropped, and as wages have not dropped in proportion, the stitch rate is now the naked manufacturing costs. By "stitch rate" is meant the price that will be charged for taking cloth supplied and returning it "stitched"—that is, embroidered. The stitch rate, therefore, should include all strictly manufacturing costs—labor, yarn, power, oil, repairs, rent—and the manufacturer's profit. At present the rate affords no profit to the manufacturer.

ARRANGEMENT OF FACTORIES.

The larger schiffli-machine factories are of brick or stone, usually two stories high, with heavy wood floor, iron columns, double windows, and saw-tooth roof. On the first floor are offices, bobbin-winding room, and one large room for the schiffli machines. On the second floor are inspecting tables, sewing machines, and brushing and shearing machine. Separate from the factory, which is always located in the suburbs or in the country, are the warehouses, which are mostly located in St. Gall. Some of these are very large and three to five stories high. Here are kept samples of goods from all over the world, great rooms full of embroidery patterns all indexed and carefully arranged, and in the basement are stored bales of cloth and yarn. In this building are the main offices, rooms for the designers, and show rooms, while the remainder of the building is devoted to inspecting the finished goods, putting them up in paste-board boxes and baling in wooden cases, and storerooms.

The industry really divides itself into four processes—stitching, bleaching and finishing, cutting out, and putting up. The larger firms own their own warehouse as well as factory, but many confine



SHUTTLE MACHINE WITH PANTOGRAPH, TO EMBROIDER 6 1/2 YARDS.

THIS MACHINE IS DIRECTLY CONNECTED WITH AN ELECTRIC MOTOR, AND IS SPECIALLY CONSTRUCTED TO HAVE JACQUARD APPARATUS ATTACHED TO IT IF DESIRED.

themselves to manufacturing, and export firms buy from them, put up the goods, and export. Cutting out is always done outside by home workers, while, with one exception, bleaching is also performed by a separate company. All the larger companies have their own designers, but smaller ones buy their patterns from special designers or have them supplied by the export company for which they are working.

PROCESS OF MANUFACTURE.

The processes straight through are as follows: The cloth and yarn are bought from Zurich or Manchester. The cloth usually comes in lengths of 63 yards, and is cut up into $6\frac{3}{4}$ -yard strips for use on the machine. It is mostly 53 or 55 inches wide. The yarn for embroidery comes ready for use on paper tubes or spools. The schiffl yarn—that is, the yarn to be used in the small shuttles—comes in larger tubes or cones and is rewound on a special automatic machine into the little bobbins, made on a bare spindle, of a size to go into the shuttle, about 1 inch long and one-fourth inch diameter. The material is then stitched. From the schiffl machines the embroidery goes to the inspecting room, where it is pinned on long tables and clippers used to remove all floating threads. It is then run over an inspecting table and all defects marked with blue chalk. It goes to the sewing machines, where all defects are carefully repaired, using blue thread. It is again run over the inspecting machine and further mistakes marked with red chalk and repaired as before. Some classes of goods are then run through a brushing and shearing machine and others brushed and threads clipped by hand. This finishes the manufacturing. Every evening the bleacheries send around wagons or automobiles and collect the day's work for bleaching and starching.

The usual 55-inch goods have three lines of embroidery woven in each width, but there may be any number of strips in a piece. These are sent out to the workers' homes and cut apart with scissors. The goods then go to the warehouse, where they are inspected, rolled on sheets of cardboard, tagged, put up in pasteboard boxes, and cased. They are marked and turned over to the shipping agent.

EMBROIDERY MAKING—MEANING OF TRADE TERMS.

Embroidery is made by "stitching" on a foundation of cloth, and the process on a schiffl machine is similar to that of a sewing machine, but instead of a single needle there is a row of needles, and instead of the cloth being laid horizontally it is fastened vertically. The foundation material is usually cambric or muslin, which is bought in wholesale lengths and cut up into pieces the length of the machine. Two strips are embroidered on each machine at a time, but as the process is exactly similar for each strip I will describe the working

parts and processes used for one. A study of Plate I will make clear the description.

A single strip of cloth is known as a "coupe," while the two strips together are called a "stickete." This coupe, usually 55 inches wide and $6\frac{3}{4}$ yards long, is fastened to pin hooks on two horizontal rollers in a vertical framework, so that it is stretched tight. Usually three pieces are sewed together side by side, so that they can be unrolled for stitching in succession and the machine stopped for renewing only when all three are finished. In front of each coupe is a sliding bar, carrying a row of ordinary needles, which are clamped to the bar at equal spaces apart. Each needle does exactly the same work as every other needle and the distance between them shows the repeat, usually called the "rapport," of the pattern. This distance is measured in French inches (1 French inch=1.08 English inches), and the 1-inch French spacing is known as the $\frac{4}{4}$ rapport.

Similarly, for other spacing the machine is called a $\frac{3}{4}$, a $\frac{6}{4}$, a $\frac{12}{4}$, or a $\frac{16}{4}$ machine. The $\frac{3}{4}$ is the smallest spacing used. There are only three makes, the $\frac{3}{4}$, the $\frac{4}{4}$, and the $\frac{6}{4}$. The $\frac{3}{4}$ machine ($6\frac{3}{4}$ yards long) contains 342 needles to a row, the $\frac{4}{4}$ machine contains 228 needles, and the $\frac{6}{4}$ machine 156 needles. To make $\frac{8}{4}$ work the $\frac{4}{4}$ machine is used and every other needle removed, similarly the $\frac{6}{4}$ is used for $\frac{12}{4}$ work, etc. The greater the separation, the larger may be the design produced, and therefore the less changing of coupes. Stitchers are paid highest for the $\frac{3}{4}$ rapport, less for the $\frac{4}{4}$, and still less for larger rapports.

AVERAGE STITCH RATES—REPRODUCING THE PATTERN.

The following table shows the yearly and half-yearly range of stitching prices, in centimes (1 centime=about one-fifth of a cent), for staple $\frac{4}{4}$ cotton embroideries from January 1, 1902 to 1908, on both schiffli and hand machines:

Year.	Schiffli machine ($6\frac{3}{4}$ yards).		Hand machine ($4\frac{1}{2}$ yards).	
	January.	July.	January.	July.
1902.....	<i>Centimes.</i> 37	<i>Centimes.</i> 33	<i>Centimes.</i> 29	<i>Centimes.</i> 29
1903.....	36	31	29	29
1904.....	27	27	23	24
1905.....	29	29	26	32
1906.....	36	38	31	35
1907.....	39	39	38	41
1908.....	34		28	

Behind each needle is a small tube, or cone, of embroidery yarn. Each paper cone holds some 500 yards or more of thread, and unless the thread breaks the needle does not have to be rethreaded, but when a cone runs out another is put on by the girl overseer without stop-

ping the machine. The needles are all fastened horizontally and point toward the cloth. The frame in which they are fixed slides back and forth, so that the needles can pierce and withdraw from the cloth, but has no other motion.

The needles, when they pierce the cloth, carry through the embroidery threads. Back of the cloth are an equal number of little pointed steel shuttles that carry small bobbins of yarn. These shuttles slide up and down in slightly sloping grooves and are controlled by a bar that moves all alike. Each shuttle carries its yarn, usually called "schiffli yarn," under the embroidery yarn, making a lock stitch similar to that of an ordinary sewing machine. The needles



FIG. 1.—Embroidering accessories of the schiffli machine. *a*. shuttles; *b*, schiffli yarn on bobbins; *c*, needles; *d*, borers; *e*, rounders.

moving in and out on a fixed slide, their working position in the cloth can only be controlled by moving the cloth. The cloth is therefore mounted on a movable framework, as stated, and this framework is moved to right or left, or up and down by means of a pantograph.

THE PANTOGRAPH—BORING AND SHAPING THE PERFORATIONS.

The pointer of the pantograph is held by the stitcher, who stands at the left of the frame, and with it he follows the lines of a design tacked on a vertical board. The design is always six times larger than the pattern to be reproduced, and the pantograph arranged for this proportion. It is seen that the schiffli machine, while large and

very ingeniously constructed, is, after all, not very complicated in its operation.

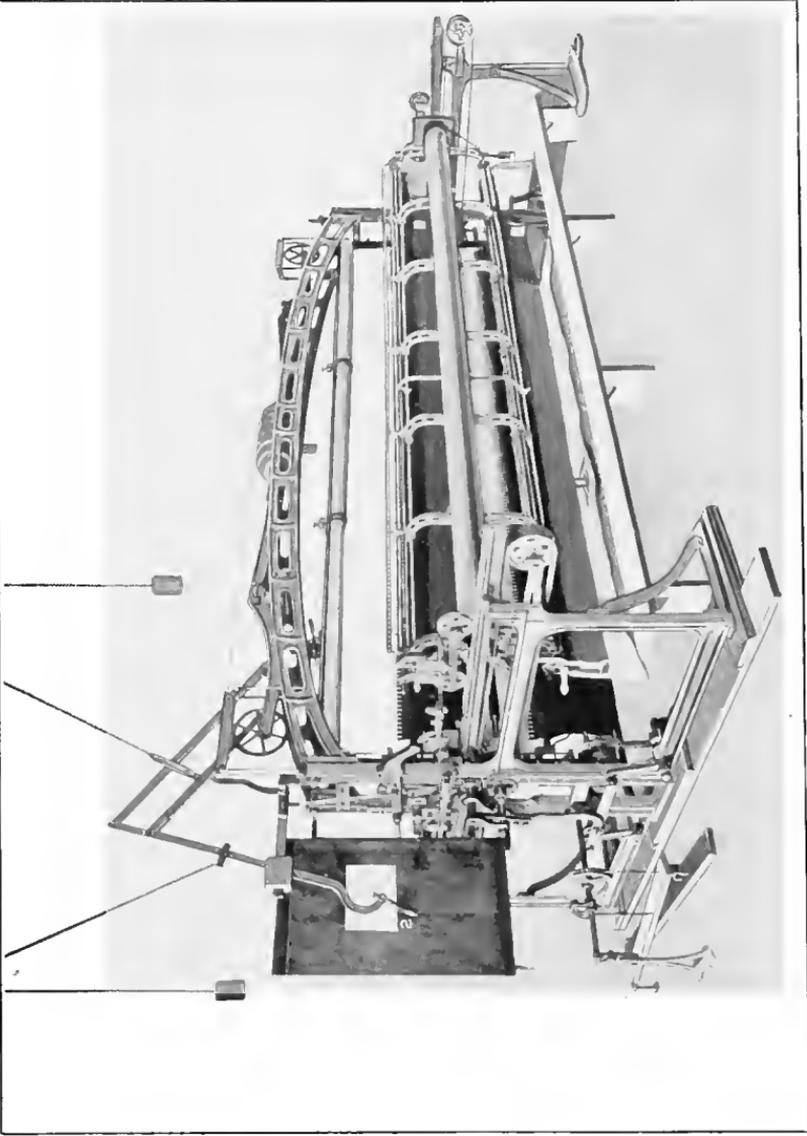
Besides the row of needles there is also usually a row of "borers," of "rounders," and of "festooners." Embroidery work without holes or openings in the cloth is called "blind work." For most embroidery it is necessary to perforate or "bore" the cloth. For this purpose there are used borers having four sharp edges tapering to a point. These are pushed through the cloth by a method similar to that used for the needles, and the holes made the size required. After these edges are embroidered another instrument called the "rounder" is run through to shape up and round out the holes previously made. Most machines also have a festooning apparatus, consisting of a line of hooks on a long bar, to catch the thread of each needle when desired and by giving it a turn to work a loose border around the finished embroidery. In Fig. 1 are shown full-size illustrations of the schiffli shuttles, the schiffli bobbins, needles, borers, and rounders. [Several sets of these accessories are on file in the Bureau of Manufactures.]

OPERATION OF THE HAND MACHINES.

The majority of the schiffli machines are grouped in factories, but owing to the present wide distribution of electric power there is an increasing number of power machines being worked at home. The majority of the cottage machines, however, are hand worked. This machine is still simpler than the schiffli machine and is an exact reproduction of ordinary sewing. The cloth is mounted on a movable framework, and, like the power machine, is controlled by a pantograph. The needles are pointed at both ends and threaded in the middle with short lengths of thread.

On either side of the cloth are movable frames that roll in and out on slides. The needles are held in clips in one movable frame, but when pushed through the cloth are grasped and pulled through by the clips of the other sliding frame. This frame moves out to the length of the thread to tighten it, then moves in and returns the needles through the cloth to the other row of clips, which repeat the process. The distance the slide moves out shortens each time with the decreasing length of the thread. The operator moves the pantograph with his left hand, with his right he operates the crank, and with his feet he works pedals that move the carriages in and out. (See Pl. II.)

The needles have to be frequently rethreaded, and for this purpose there has been invented a very ingenious little machine that takes the needles from a slot, threads each in turn and cuts off the thread to the exact length required, and sticks the needles in a row in a cushion. Those not able to afford this machine have to thread the needles by hand, which is a tedious process, especially as the lengths of thread



HAND MACHINE WITH TWO ROWS OF NEEDLES, TO EMBROIDER 4 1/2 YARDS.

have to be all the same to prevent waste. Hand-machine workers are supplied with cloth and patterns by the factory, but have to find their own yarn, power, and other requirements.

CONDITIONS AMONG THE HOME WORKERS.

To prevent advantage being taken of special workers to get work done at low wages, the hand workers, though scattered, have a strong organization that insists on equal rates to all. Some workers, however, agree to buy the machines from the men who furnish them work, and as they have to pay practically all their profit for years on installments they have a miserable existence.

For the last few years there has been a great surplus of work and the home workers have made a very comfortable living, and in some cases large profits. Just at present the money crisis in the United States has affected the industry here so that the factories themselves can not keep running full time, and most of the home workers are being thrown out of employment. The result is that they are glad to get work at any price, and in a good many cases are actually working below cost. Thus, on standard $4/4$ goods it is usually considered that, taking into account the cost of yarn and power and the cost of living, a hand-machine worker can not make a profit if the stitch rate is under 33 centimes (centime=about one-fifth cent), but I visited homes where this work is now being done at 23 centimes. The only possible reason for this seems to be that the operative can not find work on his farm during the winter and had rather work on his machine, even at a slight loss, than to get out of touch with the men who supply him with his means of livelihood. In such case the stitcher figures the work of himself and family at nothing, and has to be satisfied if the price paid covers the cost of yarn and power.

CLASSES AND PRICES OF EMBROIDERY CLOTHS.

The foundation materials for embroidery at St. Gall are mostly cambric, muslin, and nainsook. Mr. Kaufmann, United States Treasury agent at St. Gall, gives the yearly proportions as follows: English cambric, about 22,000,000 francs (franc=19.3 cents); Swiss muslin, about 10,000,000 francs; English nainsook, about 4,000,000 francs.

The January 1, 1908, quotations for the standard cloth qualities used for hand-machine and schiffli embroideries are given herewith. All other cloth qualities are according to market values. Prices are for unbleached goods and nominal number of threads (for cambrics per one-fourth inch English; for muslins per one-fourth inch French; 1 French inch=1.08 English inches). The English cloths are bought by the yard and the Swiss cloths by the aune. (One aune=1.286 yards, and 1 yard=0.778 aune; $6\frac{3}{4}$ yards= $5\frac{1}{4}$ aunes.) A "stickete," which is the amount embroidered by a machine at one time, is there-

fore $10\frac{1}{2}$ aunes ($13\frac{1}{2}$ yards) for the schiffli machine and 7 aunes (9 yards) for the hand machine, there being two rows of needles on each.

Cloths.	One piece.		One stickete.	
	Length.	Price.	Length.	Price.
Schiffli cambrics, 53-inch:				
Gray—	<i>Yards.</i>	<i>Francs.</i>	<i>Yards.</i>	<i>Francs.</i>
19/18.....	63	26.50	13½	5.89
22/19.....	63	27.25	13½	6.06
22/24.....	63	31.50	13½	7.00
Secured—				
22/26.....	63	33.50	13½	7.45
24/26.....	63	33.50	13½	7.89
Hand-machine cambrics, 53-inch:				
Gray—				
22/18.....	57	24.50	9	4.08
24/24.....	57	29.50	9	4.92
Secured—				
26/24.....	57	33.00	9	5.50
22/26.....	57	35.00	9	5.88
26/28.....	57	37.00	9	6.17
30/30.....	57	40.00	9	6.66
Swiss muslins:				
47½-inch (120 cm.), 2 f. ^a —	<i>Aunes.</i>			
22/18.....	44	22.00	9	3.66
22/20.....	44	23.00	9	3.83
22/24.....	44	24.00	9	4.00
24/24.....	44	27.00	9	4.50
24/26.....	44	30.00	9	5.00
26/26.....	44	33.50	9	5.88
55-inch (140 cm.), 2 f. ^b —				
22/18.....	48	29.00	13½	6.44
22/20.....	48	31.00	13½	6.89
22/24.....	48	34.00	13½	7.55
24/24.....	48	36.00	13½	8.00
24/26.....	48	38.00	13½	8.44
26/26.....	48	40.25	13½	8.95

CHEMICAL LACES.

	<i>Meter.</i> ^c			
For the schiffli machine:				
Wool cloth, 14/14, 160 cm., up to 100/3 yarn.....	1	1.00	13½	12.25
Wool cloth, 16/16, 160 cm., for 120/3 yarn.....	1	1.25	13½	15.65
Silk cloth, 120 cm., for above 120/3 yarn.....	1	1.80	13½	22.50
For the hand machine:				
Silk cloth, 120 cm.....	1	1.95	9	17.20

^a 1 f. one-half franc per piece more. ^b 1 f. three-fourths franc per piece more.

^c Meter=39.37 inches.

EMBROIDERY YARN—FACTORY METHODS.

The embroidery yarns used runs from 40s to 240s, and is always ply yarn. Formerly the main number was 120s 3 ply, but as 60s 2 ply is the same size and is cheaper, this is now the predominating number. A large portion of the yarn is Egyptian cotton. Of course all these yarns are combed. There is a large consumption of 200s for the fine work and a smaller consumption of 240s, and some even finer, for special work. A good deal of mercerized yarn is used, and there is much embroidery made by threading alternate needles with artificial silk and with Egyptian yarn, which makes the repeat seem double the actual. The factories on fine goods do quite a little manipulating with the machines; such, for instance, as embroidering the center of the figure with silk, rethreading the needles, and embroidering the remainder of the figure with Egyptian cotton. In other cases chem-

ically prepared cloth is used with a backing of cotton cloth, and in places the cotton backing is folded back and the embroidery made on the chemical cloth alone. When finished the chemical cloth disappears and there is shown embroidery with spaces of open-lace effects, etc.

Different embroidery is made for different markets. An instance may be noted in the holes or bores in the cloth. For England quite a little is made with elliptical holes, but for the United States the round hole is the style. A large amount of embroidered cotton net is sent to France, but comparatively little to the United States, etc. As the schiffli yarn (used in the shuttles) does not show, it is usually finer than the embroidery yarn, being cheaper because giving more yards to the pound. This fact alone will usually show whether the embroidery is made on the schiffli or on the hand machine, as the latter uses the same thread on both sides.

BURNT-OUT LACE—REGULATION OF EMBROIDERY VALUES.

Most of the lace made at St. Gall is the kind known as "burnt-out lace," and is made on the regular schiffli embroidery machine. It is made on a foundation of prepared woolen or silk cloth instead of the ordinary cotton cloth. After manufacture this is treated with chemicals and the blue or yellow chemical cloth disappears, leaving the cotton lace uninjured. Some of this material is prepared so that by passing a hot iron over it the animal material disappears, as in the case of the chemical treatment, leaving the cotton.

In regard to the expense of making embroidery ready for sale it will be found that on most embroideries the stitch rate is the largest item, then the cost of the foundation material, and then the bleaching and putting-up costs. In the case of embroideries shipped to the United States these rates are all officially fixed every week by an agent of the United States Treasury stationed at St. Gall, who keeps in active touch with the market. His method is to ascertain the market rates and fix the official values for stitch rate, for bleaching, for cutting out, and for special work. These uniform values have to be figured in the export valuation of every lot of goods.

There then has to be figured in 5 per cent for office and managing expenses—in other words, fixed charges, including salary, insurance, interest, and taxes. To this the exporter has to add at least 8 per cent for profit. For fine goods and specialties the profit thus figured runs from 8 to 50 per cent, but must be put down on the invoice between these limits. There is then added the cost of the pasteboard boxes and the wooden cases, the legalization or consular fee, amounting to \$2.50 on each invoice, and then the freight. The insurance in transit is usually paid in the United States.

MANUFACTURING COSTS.

To give a complete idea of this system, and also to show some of the inside manufacturing costs, I will first give a summary of the official table made up by the Treasury agent, then details of some of the costs, and then figure the costs landed at New York of a couple of standard styles of embroidery.

The following are the official rates for stitchwork, etc., that had to be adhered to in their detailed valuations by all exporters shipping embroideries to the United States during the week from December 19 to 26, 1907:

HAND-MACHINE EMBROIDERIES WITH COTTON THREAD.

The hand-machine stitch rates for the different classes of embroidery are as follows:

Rapport.	On cambric, nainsook, or muslin with white or ecru yarn.		On white foundation with colored yarn (one color only).		On colored foundation with white yarn.		On colored foundation with colored yarn (one color only).	
	Coarse.	Medium and fine.	Coarse.	Medium and fine.	Coarse.	Medium and fine.	Coarse.	Medium and fine.
	Centimes.	Centimes.	Centimes.	Centimes.	Centimes.	Centimes.	Centimes.	Centimes.
6/4-----	30	28	36	32	36	36	38	38
5/4-----	34	32	36	34	40	40	44	44
4/4-----	34	28	42	36	40	38	44	42
3/4-----	48	40	52	52	52	52	52	52

Grätli, 4/4, up to 100 stitches, 45 centimes per grätli; up to 200 stitches, 38 centimes; from 200 stitches upward, 34 centimes.

Hand-machine embroideries, large repeats, 8/4, 12/4, 16/4 and larger, each 27 centimes. Irregular shirt waist and other irregularly embroidered material, 3/4 to 24/4, 42 centimes per 100 stitches.

Hand-machine embroideries with application (net or other cloth), 4/4, 6 centimes more than others; 6/4, 8/4, and 12/4, each 4 centimes more than others.

Coarse, up to 150 stitches per needle thread. Colored, 3 centimes more for each color. Glanz yarn, 2 centimes more than others.

For finishing the rates per coupe of $4\frac{1}{2}$ yards on goods up to 55 inches in width are:

Description.	Cost.
Singeing, bleaching, and finishing white goods.....	91
Singeing, washing, and finishing ecru goods.....	80
For colored foundation with white or colored yarn.....	91
For white foundation with colored yarn.....	91

Embroideries with woven laces, tucks, or on double cloth, piqué, etc., 50 per cent more.

Hand-machine laces and trimmings, and all other special articles, including white goods, special articles, glanz-yarn embroidered goods, embroideries on linen, mercerized cloth, and other cloth than cambric, muslin, or jaconet, according to the article.

SCHIFFLI EMBROIDERIES WITH COTTON THREAD.

For the 6 $\frac{1}{2}$ yards machine: 3/4, 44 centimes; 4/4, 34 centimes; 6/4, 30 centimes; 8/4, 30 centimes; 12/4, 28 centimes; 16/4 and larger, 29 centimes.

For finishing the rates per coupe up to 6¼ yards on goods up to 55 inches in width are:

Description.	Cost.
Singeing, bleaching, and finishing white goods.....	<i>Francs.</i> 1.32
Singeing, washing, and finishing ceru goods.....	1.15
For colored foundation with white or colored yarn.....	1.32
For white foundation with colored yarn.....	1.32

Embroideries with woven laces, tucks, or on double cloth, piqué, etc., 50 per cent more.

Colored, 3 centimes more for each color. Glanz yarn, 2 centimes more.

On cotton net foundation (Orientales), for the 6¼ yards machine: 4/4, 40 centimes; 6/4, 40 centimes; 8/4, 38 centimes; 12/4, 35 centimes.

Bleaching, dyeing, and finishing, 2.50 francs up to 160/1 (400 centimeters), 6¼ yards one coupe.

Cotton chemical laces (without application), for the 6¼ yards machine: 6/4, 28 centimes; 8/4, 29 centimes; 12/4, 28 centimes; 16/4 and larger, 30 centimes.

The stitch rates for cotton chemical laces with net, batiste, or other cloth applications to be valued at 2 centimes more for each repeat. Irregularly embroidered schiffli-machine materials, 5 centimes more per 100 stitches in all repeats.

Silk chemical laces and silk embroideries, same stitch prices as cotton, but the proper prices for silk thread.

Schiffli-machine special articles, including white goods special articles, glanz-yarn or colored embroidered goods, embroideries on linen, mercerized cloth, and other cloth than cambrie, muslin, or jaconet, according to the articles.

EMBROIDERED HANDKERCHIEFS.

Embroidered handkerchiefs on cotton and on linen foundation, per frame of 24 pieces, for all four borders:

Description and rapport.	Up to 200 stitches.	Up to 400 stitches.	Up to 700 stitches.	From 700 stitches upward.
	<i>Centimes.</i>	<i>Centimes.</i>	<i>Centimes.</i>	<i>Centimes.</i>
White embroideries:				
6/4.....	62	54	48	40
4/4.....	58	52	46	40
Colored embroideries (one or two colors only):				
6/4.....	75	65	60	48
4/4.....	75	65	60	48

Hand-machine handkerchiefs irregularly embroidered (without frames): 4/4, up to 300 stitches, 50 centimes; from 300 stitches upward, 45 centimes; 6/4 up to 200 stitches, 50 centimes; from 200 stitches upward, 45 centimes.

Schiffli-machine handkerchiefs: 4/4, 2×17=34^{er}, 34 centimes per 100 stitches.

For embroidering handkerchiefs of silk the following rates additional to those for cotton or linen are charged:

Description.	Up to 700 stitches.	From 700 stitches upward.
	<i>Centimes.</i>	<i>Centimes.</i>
Cotton embroidered:		
White.....	8	5
Colored.....	8	5
Silk embroidered:		
White.....	15	10
Colored.....	15	10

Glanz yarn, 2 centimes more.

Sewing together, bleaching, and finishing (excluding cutting out, hemming, and making up): Muslin and nainsook, up to 700 stitches, 25 centimes per dozen; from 700 stitches upward, 31 centimes per dozen; linen, 37 centimes per dozen.

OTHER INCIDENTAL PROCESSES AND PRODUCTS.

For Gegauf and other sewing-machine work the following rates:

Description of work.	Gegauf.	Singer.
	Centimes.	Centimes.
Hemming handkerchiefs.....per dozen..	50	35
Hem in continuous length.....per aune..	3½	2½
Blind tucks in continuous length.....do..	1	1

Cutting out (for ordinary scallops): For hand-machine embroideries, 0.6 centime per aune; for schiffli-machine embroideries, 0.7 centime per aune.

Hand and schiffli machine embroideries on double cloth, 3 centimes more per 100 stitches for each repeat.

Hand and schiffli machine ties and scarfs, 3 centimes more per 100 stitches for each repeat.

APPLICATION OF THE STITCH RATE.

The "stitch rate," as previously explained, is the price charged by the manufacturer for stitching, and this is usually the largest item in the cost of the finished embroidery. The wages of the "stitcher," the man who operates the machine, are usually about one-fifth of the stitch rate, but this varies with the different qualities. The stitcher is paid by the hundred or by the thousand stitches in a repeat of the pattern.

Suppose there are 500 stitches in a repeat of 4/4 goods, and that there are three strips of embroidery to be made from each 55-inch width. The stitcher has to run his pantograph pointer over the design for one strip, then move the cloth up one-third its width, trace the design again, move the cloth up another third, and trace again. He is therefore paid for 3 times 500, or 1,500 stitches. As there are two pieces of cloth on a machine at the same time, he really embroiders six strips, but as the lower row of needles simply duplicate the work of the upper this is not considered in fixing his wages. If he is paid 7 centimes a hundred stitches, he makes therefore 7 times 15, or 1.05 francs a stickete. If he makes 12,000 stitches a day, he gets off 8 sticketes and makes 8.40 francs, say \$1.62. The schiffli machines can run up to 120 stitches a minute, but this depends on the class of work, and for ordinary goods 80 stitches a minute is a good average.

The embroidery factories usually run ten and one-half hours a day (the variations are from nine to eleven) nominally; that is, they start at 7 o'clock and run to 12, start at 1.30 and run to 7, but there is a fifteen-minute rest at 8 and at 4 o'clock, so that the actual time is not over ten hours. Eighty stitches a minute for 600 minutes gives

48,000 stitches as the theoretical production, but the actual production varies between 8,000 and 12,000 stitches a day, so that on few goods can the production be figured over 25 per cent of the theoretical.

STITCHERS' WAGE TARIFFS.

Two tariffs, found posted in separate factories, are given, showing the wages paid stitchers for various classes of goods. The first may be taken as the average wages for ordinary standard articles, while the second is from a mill on fine specialties and may be taken as the high-water mark. All prices are in centimes per 1,000 stitches (100 centimes=19.3 cents) :

BORE WORK (EMBROIDERIES).

Classification.	Average.		Special.	
	6½ yards.	10 yards.	6½ yards.	10 yards.
	Centimes.	Centimes.	Centimes.	Centimes.
4/4 blind.....	60	70	65	80
4/4 minimum.....	65	80	70	85
4/4 under 1,000 stitches.....	70-80	100	100	120
4/4 1,000 to 2,000 stitches.....	75-80	90	88	105
4/4 2,000 to 3,000 stitches.....	70-75	85	78	95
6/4 blind.....	55	60	60	65
6/4 minimum.....	60	60	65	70
6/4 under 1,000 stitches.....	80-85	95	95	105
6/4 1,000 to 2,000 stitches.....	75-80	85	85	95
6/4 2,000 to 3,000 stitches.....	65-70	75	75	85
Large rapports:				
Minimum.....	60	70	65	75
Under 1,000 stitches.....	80	90	85	105
1,000 to 2,000 stitches.....	75	85	85	95
2,000 to 3,000 stitches.....	65	75	75	85

Samples of any rapport, 15 to 20 centimes extra.

BURNT GOODS (LACES).

3/4 with or without cord.....	55	60	62	67
4/4 smooth goods.....	50-55	60	58	67
6/4, 8/4, 12/4, and larger rapports, smooth goods.....	50-52	60	57	67
Application to rapport, additional.....	3	4	5	10
High relief, additional.....	3	2	5	10
Blonso goods:				
4/4, additional.....	10-12	10	20	15
6/4 and larger rapports, additional.....	10	10	15	15
Samples, per rapport additional.....	2	2	3	3

For extraordinary relief, application with two or three cloths, silk goods included, by agreement.

On silk and very fine goods the stitcher is usually paid by the day, especially for work that has to be done very slowly and carefully.

WAGES OF OTHER OPERATIVES—FREIGHT AND INCIDENTAL EXPENSES.

In regard to other operatives, the girl overseer, who walks up and down the front of the machine to see that the needles are stitching correctly, keeps the needles threaded, corrects any slight defects found, etc., is usually paid 2½ or 3 francs a day. The shuttle filler usually gets 2 francs a day. She keeps the schiffli shuttles supplied with the little 1-inch bobbins of yarn, and for ordinary work it takes a shuttle filler to a machine. The girls who inspect the cloth, those who repair

defects with the sewing machine, and others get also from 2 to 3 francs. The superintendent of an 80-machine factory on fine goods that I visited got 400 francs a month, but 250 francs a month is about the average. The highest paid men in the business are the managers of the company and the designers, who are paid wages more nearly corresponding to what similar men would get in the United States.

The cost of bleaching and of cutting out has been given in the Treasury statement.

In freight rates there is a slight difference according as shipped by Hamburg, Southampton, or other points. The present rate by way of Hamburg is $13\frac{1}{2}$ francs per 100 kilos (\$2.61 per 220.46 pounds), and the insurance on goods in transit is one-fifth of 1 per cent. The pasteboard boxes in which the embroideries are put up cost from 30 to 50 centimes each, while the average wooden case containing, say, some 225 kilos costs $16\frac{1}{2}$ francs, or \$3.13, each.

ELECTRIC-POWER RATES IN ST. GALL.

The city of St. Gall supplies electric power to factories and to home workers, and there are also outside companies, who get their power from waterfalls. As this saves a great deal in the first cost, all of the new mills use electric power, and most of the old ones have taken out their old steam and gas engines for this source of supply. Last year, owing to an unusually dry season, there was not enough water for the electric plants, and some of the mills that had changed over had to make hurried alterations and fall back on their old source of supply and those that had none had to run short time. Some of the mills for this reason still kept their old engines as an auxiliary in case of trouble. The following schedule of yearly rates for electric power, furnished me by the city of St. Gall, has been reduced to United States values:

Horsepower.	Rate.	Horsepower.	Rate.
One-half.....	\$48.25	Five.....	\$308.80
One.....	81.06	Six.....	365.93
Two.....	144.75	Ten.....	579.00
Three.....	202.65	Twenty.....	1,003.60
Four.....	252.06	Forty.....	1,698.40

All power is supplied on a yearly contract. The rates given are for 1908, being the new rates just made. They are much higher than the 1907 rates, when the rate for 1 horsepower was \$62.73, and others in proportion. The $6\frac{3}{4}$ schiffli machine requires about one-fifth horsepower per machine.

EXPERIMENTAL BLEACHING IN THE UNITED STATES.

To show the proportions of the component costs in the manufacture of embroideries I have worked out the following details in regard to two standard makes of 4/4 embroidery, one having 385 stitches and

the other 1,079 stitches. [The original samples are on file in the Bureau of Manufactures. For illustration of them see Figs. 2 and 4.]

The figures, of course, are for bleached goods, as few goods are shipped in the gray to the United States or elsewhere. Those that are so shipped are either goods to be used in the gray, of which there is a small amount, or else, as occasionally happened last year, goods that

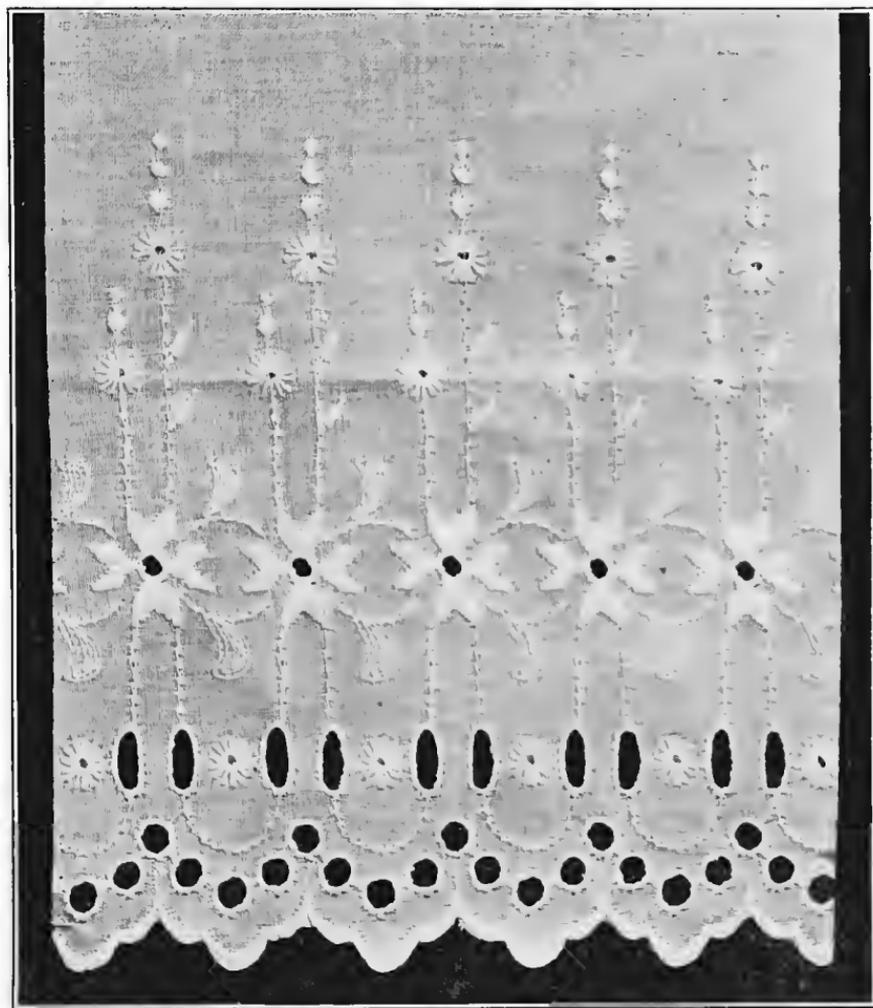


FIG. 2.— $\frac{1}{4}$ Rapport embroidery, 385 stitches in a repeat. Stickete, $13\frac{1}{2}$ yards. $13\frac{1}{2}$ yards of cambric weighed 1.82 pounds, the finished embroidery 3.36 pounds.

could not be finished in time, because the bleacheries were so rushed, and were therefore sent over to be finished in the United States so as to be delivered on contract time.

One manufacturer informed me that his firm had tried the experiment of having goods bleached in the United States. Shipping in the gray, the goods not being put up in cardboard, saved in freight, and

the value of the gray goods being much lower than the bleached and finished goods, there was quite a saving in duty. Also, the cardboard and boxes were cheaper in the United States and the cost of putting up not materially different. His firm figured that, on the whole, it was slightly cheaper to ship in the gray and bleach and make up in the United States than to ship the bleached goods, but that on account of the American bleaching not being as pure white as the Swiss bleaching and because they have their own warehouse, etc., for this

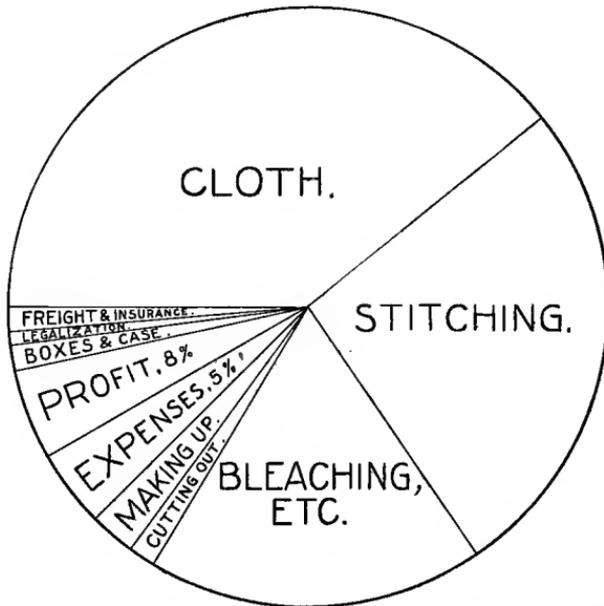


FIG. 3.—Diagram showing cost distribution of embroidery shown in Fig. 2.

purpose already at St. Gall, they have never followed up the results obtained.

COST DISTRIBUTION.

The detailed itemization of the cost of the 4/4 rapport embroidery, 385 stitches in a repeat, shown in Fig. 2, is as follows:

	Francs.
Cloth, two 6 $\frac{3}{4}$ -yard pieces of 53-inch cambric, 19/18 construction.....	5. 89
Stitching, etc., 385 stitches, at 34 centimes, 3 strips.....	3. 93
Bleaching and finishing.....	2. 64
Cutting out, 10 $\frac{1}{2}$ aunes, at 0.7 centime an aune, 3 strips.....	. 21
Making up, carding paper, etc.....	. 36
Expenses, 5 per cent.....	. 55
Profit, 8 per cent.....	. 84
Boxes, case, etc.....	. 20
Legalization (\$2.50=13 francs for, say, 10 cases).....	. 01
Freight and insurance (freight at 13 $\frac{1}{2}$ francs per 100 kilos; insurance at 0.2 per cent).....	. 24
Total	14. 87

This would be price f. o. b. New York. To this has to be added 60 per cent duty and then about 75 per cent to cover all expenses between

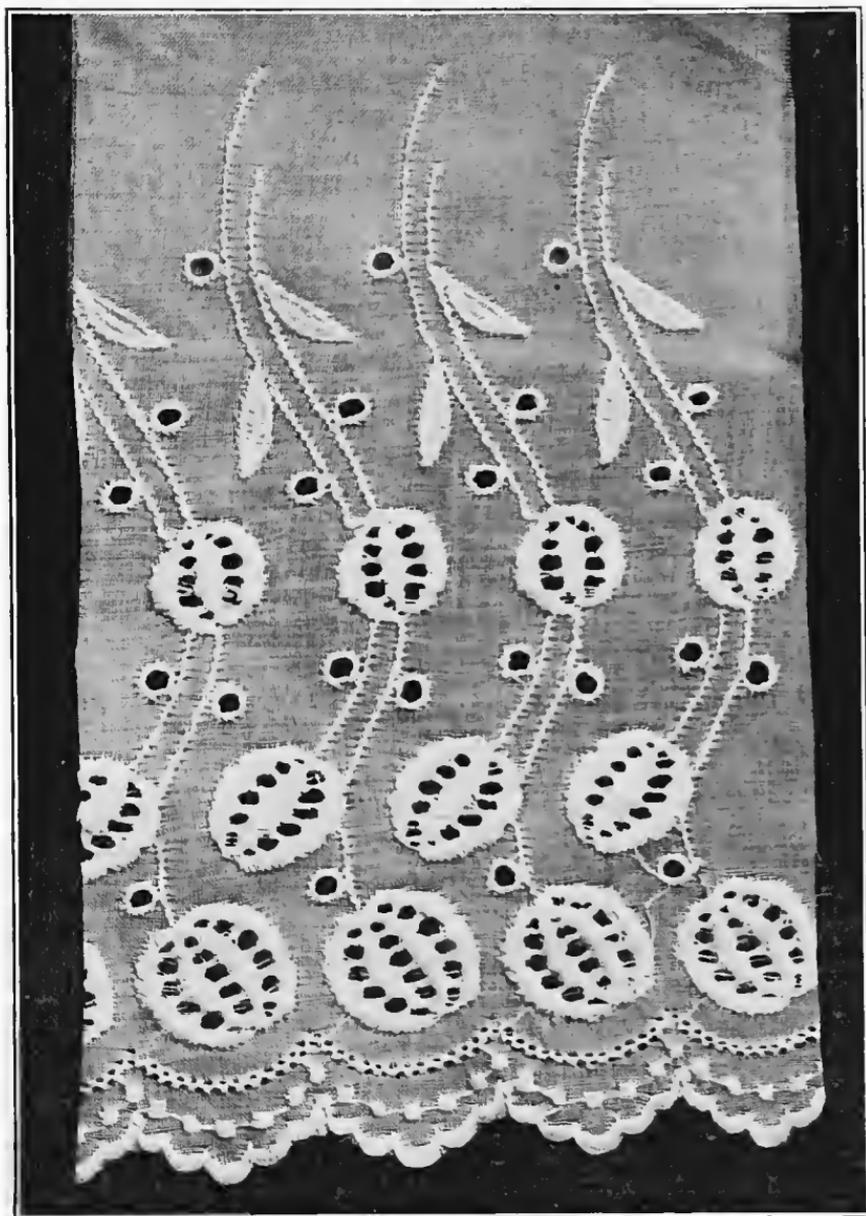


FIG. 4.—Plattstich embroidery, $\frac{4}{4}$ rapport, 1,079 stitches in a repeat. Stickete, $13\frac{1}{2}$ yards. $13\frac{1}{2}$ yards of muslin weighed 1.67 pounds, the finished embroidery 3.81 pounds. 130 sticketes, or 5.265 yards of single strips, put up in each case.

the custom-house and the customer, including landing charges, importer's costs, etc., and retailer's profit, so that the retail price in New

York would be $41\frac{1}{2}$ francs, or, say, \$8. As each stickete consists of six strips 17 inches wide and $6\frac{3}{4}$ yards long, this is $40\frac{1}{2}$ yards for \$8, or, say, 20 cents a yard.

The stitch rate in the above case, not including the manufacturing profit, was made up as follows: Stitcher, 8 centimes; overseer, 3 centimes; shuttle filler, 2 centimes; repairing, etc., 2 centimes; yarn, 15 centimes; power, oil, and other expenses, 4 centimes; total, 34 centimes.

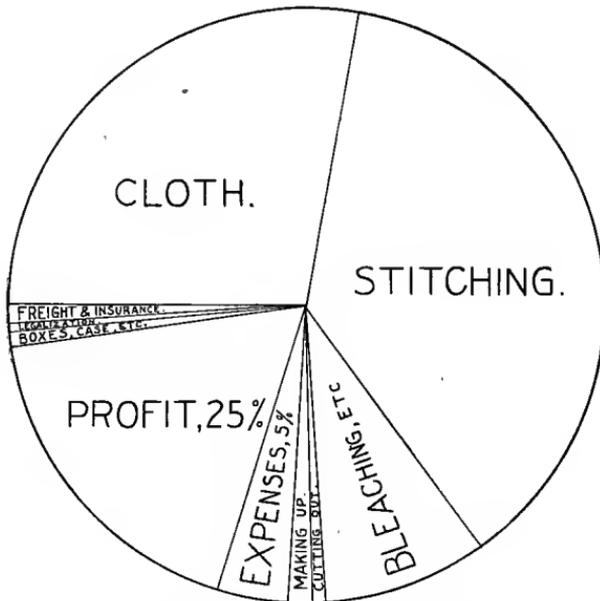


FIG. 5.—Diagram showing cost distribution of embroidery shown in Fig. 4.

The items of cost of the Plattstich embroidery shown in Fig. 4 are as follows:

	Francs.
Cloth, two $6\frac{3}{4}$ -yard pieces of 55-inch muslin, 22/24 construction.....	8.00
Stitching, etc., 1,079 stitches, at 34 centimes, 3 strips.....	11.00
Bleaching, etc.....	2.64
Cutting out, $10\frac{1}{2}$ aunes, at 0.7 centime an aune, 3 strips.....	.21
Making up, carding paper, etc.....	.36
Expenses, 5 per cent.....	1.10
Profit, 25 per cent.....	5.28
Boxes, case, etc.....	.20
Legalization (\$2.50= 13 francs for, say, 10-case invoice).....	.01
Freight and insurance (freight at $13\frac{1}{2}$ francs per 100 kilos; insurance at 0.2 per cent).....	.20
Total.....	29.09

This would be the price f. o. b. New York. To this has to be added the 60 per cent duty and, say, 100 per cent for intermediate costs, including landing charges, importer's costs, etc., and retailer's profit, so that the retail price in New York would be about 93 francs, or, say

\$18. As each stickete (the amount embroidered on a machine at one time) consists of two $6\frac{3}{4}$ -yard lengths, each containing three single strips, this makes the price per yard of each strip about 45 cents.

The history of this particular piece of embroidery might be summed up as follows:

	Per pound.
Raw cotton sold by American farmer at.....	\$0. 12
Muslin sold by Manchester manufacturer at.....	. 92
Embroidery sold by St. Gall exporter at.....	1. 48
Embroidery bought by American farmer's wife at.....	4. 75

ANALYSIS OF THE LAKE CONSTANCE WATER.

One of the main advantages of the Swiss over the American embroideries has always been claimed to be the exceptional whiteness of its bleaching. Most of the water used for bleaching in the St. Gall district is obtained from Lake Constance, and to test their claim in this respect I had an analysis made by the best expert in this line at St. Gall and submit a translation of the same herewith:

[Expert analysis of the Lake Constance water, by E. Schaufelberger, St. Gall.]

Water is judged, first, according to its appearance, and, second, according to its chemical properties. In appearance it should be colorless, clear, and above suspicion. As to its inner properties, it should be not too hard, or at least should possess only so-called temporary and not permanent hardness.

The average analysis of the water of Lake Constance, with a comparison of other Swiss waters, is as follows:

[Amounts stated in milligrams to liter.]

Constituents.	Lake Constance water.				Spring water. ^a	River water.	Pond water.
	Sample 1.	Sample 2.	Sample 3.	Sample 4.			
Carbonate of lime.....	98.3	126.0	126.5		187.2	108.8	198.0
Carbonate of magnesia.....	16.5				21.0	18.2	16.0
Sulphate of lime.....	41.6	14.4	15.7	Trace.			
Chloride of soda.....	2.7						
Silicic acid.....	3.2						
Argillaceous earths.....	Trace.						
Oxide of iron.....	Trace.			Trace.			
Potash.....	Trace.						
Dry residuum.....	186.0	174.0	176.0	197.0	464.0	290.8	281.8
Calcined residuum.....	173.2	148.0	152.0	186.0	374.0	226.8	213.2
Total carbonic acid.....	126.1				171.0	111.0	88.0
Fixed and one-half fixed carbonic acid.....	120.4						
Free carbonic acid.....	5.7						

DEGREES OF HARDNESS SHOWN BY ANALYSES.

	°French. ^b	°French.	°French.	°French.			
Total hardness.....	15.7	15.0	15.0	18.0			
Temporary hardness.....	11.5	12.5	12.5	12.5			
Permanent hardness (gypsum or sulphate of lime).....	4.2	2.5	2.5	5.5			

^a Pure, very hard.

^b 1° French=1 part carbonate of lime, in 100,000 parts water. Scale: 1° German=1.79° French=1.25° English hardness.

The water of Lake Constance is therefore comparatively pure, and may even be used for drinking (especially if filtered). The properties of the water make it excellent for bleaching purposes.

By dividing the calcined residuum by 10 the degree of total hardness may be approximately ascertained and a comparative table may be made of the various analyses.

Bleaching can be effected with hard water if an arrangement exists for purifying the water. The Clark method ^a is a good and cheap one for this purpose. It is the best for depositing the carbonate of lime, which can then be removed, and the cost of it is small.

Purified water is good for use in steam boilers, as it enables considerable saving to be made in soap, soda, acids, etc.

CONSULAR REPORT.

[By CONSUL-GENERAL S. C. MCFARLAND, ST. GALL.]

St. Gall is the clearing house of a large manufacturing district embracing some four Cantons. The actual producing processes are carried on in numerous and small towns, in villages, and almost universally in the homes of the inhabitants. The highest in altitude of any community in the civilized world, its surrounding hills practically capable of producing grass only, its people in the last century were impelled to creative industry, and were assisted by its location on the old route between Italy, Canton Grisons, and south Germany. At first all attention was given to flax products, and the looms to be found in almost every house soon gave it a local reputation in linens. The introduction of cotton rapidly changed all this, and the house workers in flax developed into expert producers of handmade laces and embroideries, for which the district of Appenzell is still famous. The Rittmayer embroidery machine was invented near St. Gall about 1830, but it was not until 1886 that the first half dozen machines were in operation to compete with hand machines. The growth was then rapid, new improvements being added by various manufacturers, until the number now in operation in the embroidery district—the Cantons of St. Gall, Appenzell, Thurgau, Zurich, and of the Vorarlberg, for which St. Gall is the market and clearing house—is approximately 6,000. These are all immense new machines, whose use dates back not further than 1894, machines in prior use having been necessarily relegated to the scrap heap. Of hand machines, which have not materially changed in character, there are some 16,000 in operation, according to Mr. Karl Kaufmann, the American treasury agent at St. Gall.

DEVELOPMENT OF AMERICAN AND SWISS EMBROIDERY INDUSTRIES.

It is here interesting to summarize the American embroidery development. From 1890 to 1906 the number of embroidery plants estab-

^a A full description of this method may be found on page 410 of "Water Supply," by Prof. W. P. Mason, published by John Wiley & Sons, New York City.—B. of M.

lished in the United States and the number of machines therein were as follows:

State.	Estab-lish-ments.	Ma-chines.	State.	Estab-lish-ments.	Ma-chines.
New York	62	291	Missouri	1	4
New Jersey	60	233	Illinois	4	19
Pennsylvania	11	29	California	1	1
Connecticut	3	36			
Maryland	1	3	Total	143	616

Including four machines sent to Canada, Switzerland furnished 259 of these machines and Saxony 361, a total of 620.

The exportation of Swiss machines to the United States still continues; but manufacture there can reach development only through trials identical to those experienced at St. Gall. The low wage rates here laid the foundation of the industry; and with it, aided by abundance of pure water, grew up the accessories of bleaching, dyeing, finishing, machine and tool production, and the almost numberless subindustries whose very existence is dependent upon the mother industry. The blending of community interests in practically one product—such as, for instance, embroideries at St. Gall; silk cloth at Zurich; silk ribbons at Basle; gold watches at Geneva; common watches, in all possible grades, at Neuchatel and Solothurn; locomotive and heavy machinery at Winterthur; electrical machinery at Oerlikon and Baden; embroidery machinery at Arbon; knitted goods in Aargau, and chocolate and cheese in their specific cantons—may not be the wisest economic procedure. Diversification may offer the advantage of modifying the disasters of inevitable hard times in one industry, but the application in one line of all thought and all effort, generation after generation, results in a rare perfection and economy of product. This is the chief secret of St. Gall embroideries.

LABOR, WAGES, AND EXPORTS.

Mr. Kaufmann places the number of office embroidery employees—designers, enlargers, and clerks—at 7,000 in St. Gall, and of direct embroidery work people of both sexes in the district at 80,000. In allied industries, outside of dairy and purely mercantile pursuits, may be aligned almost the entire balance of the population. Factory wages, small from an American standpoint, are perhaps the highest in Europe, as is also the standard of living. Foremen receive from \$1.20 to \$1.80 a day, expert stitchers from 90 cents to \$1.90, ironers from 90 cents to \$1, and less expert workers down to 60 cents. Salaries of managing experts are large, even from an American salary standpoint. Three-fourths of the factory and house workers are females.

The number of manufacturers and exporters having warehouses or headquarters in St. Gall is about 250, and the total value of ex-

ports of embroideries and laces alone from the district in 1906 was \$30,593,474, distributed as follows:

Whither exported.	Value.	Whither exported.	Value.
United States	\$14,877,148	Canada	\$857,465
Great Britain	6,279,184	Central America	612,543
Germany	2,348,628	Argentina	707,745
France	1,667,218	Australia	220,586
Italy	634,680	Holland	208,786
Belgium	501,574	British India—Asia	484,056
Spain	568,840		
Austria	625,021	Total	30,593,474

The largest single St. Gall concern exports annually about \$2,000,000, chiefly to the United States, while several fall only a small sum below this. The average concern, however, exports about \$200,000. There are many engaged in business on a small scale—collectors of house-industry products—whose aggregates run only from \$2,000 to \$10,000.

GREAT INCREASE IN EXPORTS TO THE UNITED STATES.

The exports of laces and embroideries to the United States given in the foregoing general statement throw some light on that St. Gall industry, but nothing illuminates it like the record of total exports to the United States for specific years since 1864, as follows: 1864, \$67,989; 1870, \$1,343,744; 1880, \$4,351,995; 1890, \$7,247,952; 1900, \$7,389,924; 1906, \$15,981,168.

The following statement shows the value of declared exports from the consular district of St. Gall to the United States during the three months ended September 30, 1907:

Article.	Value.	Article.	Value.
Appenzell goods, hand embroideries ..	\$3,365	Job of handkerchiefs	\$13,935
Bolting cloth, silk	26,108	Kilo embroideries (imperfections):	
Cheese	97,183	Hand machine	12,929
Chocolate	2,893	Schiffli machine	29,962
Church articles	4,287	Machines and parts thereof	11,741
Cotton embroideries:		Plain cotton cloth:	
Hand machine	784,982	Muslin, nainsook, etc	28,569
Schiffli machine	1,873,695	Typewriting cloth	10,008
Cotton laces and trimmings:		Ribbons	1,176
Hand machine	35,027	Silk laces and trimmings:	
Schiffli machine	173,272	Hand machine	91,687
Collars, blouses, robes, ties, and other		Schiffli machine	21,226
embroidered cotton fancy articles ..	102,204	Tidies, pillow shams, scarfs, and other	
Curtains	300,342	tamboured articles, except curtains	
Figured and dotted Swisses:		Yarn	41,230
Woven	32,167	Miscellaneous articles	16,523
Embroidered	9,939		
Gegauf, tucks, and other sewed arti-		Total	4,112,753
cles	4,691	Total same period in 1906	3,919,763
Handkerchiefs	271,947		
Job of hand-machine embroideries ..	19,318	Increase	192,990
Job of Schiffli-machine embroideries ..	67,222		

MARKET AFFECTED BY AMERICAN FINANCIAL DISTURBANCE.

The recent American financial disturbance might have been presumed, had its occurrence been foreseen, to have produced much more serious local consequences than have as yet resulted. Of the total Swiss embroidery exports of \$30,593,474 in 1906, the United States took \$14,877,148, Great Britain coming next with \$6,279,184, and the balance being distributed throughout the world. During 1907 ex-

portations not only increased, but the United States has taken a greater proportionate share. As the industry not only relies chiefly upon the American market, but with respect to many of its concerns is American in fact, the sudden stoppage of business upon the other side, coupled with fully 33½ per cent of cabled cancellations of orders booked and largely in hand, might well have been disastrous. That conditions were somewhat unhealthy did not tend to help the situation.

In 1864 embroidery exports to the United States were \$67,550 and in 1897 they had risen to \$5,734,029. In 1906 they had jumped to \$14,877,148, and for 1907 (December estimated) will amount to over \$18,000,000. These figures presume a boom growth, which exactly describes conditions when the American financial crisis upset all plans and threw the market into a state of almost hysterical uncertainty. The increase in October had been \$749,853 as compared with October, 1906, the month's total figures being \$1,822,560, breaking all records. It had been figured, upon the basis of orders received and in prospect, that November and December increases would show a similar gain over the figures for the corresponding months of last year, and that until June, 1908, at least, nothing was in sight to disturb the phenomenal growth of business so far as the United States was concerned.

The figures given for 1907 (December estimated) need explanation in view of my former reports fixing the probable total at between \$19,000,000 and \$20,000,000. As a basis for previous figures I took my predecessor's annual declared export return for 1906, figuring therefrom current gains by months. It recently became apparent that our aggregate of monthly totals would not balance with these figures. My predecessor's figures for 1906 were therefore gone over month by month, resulting in the discovery that, instead of a total business of \$15,981,168, as he reported, the actual figures should have been \$14,879,058, a difference of \$1,102,100, which exactly explains my previous miscalculations.

EXCESSIVE MANUFACTURING ACTIVITY.

Old concerns were increasing their plants as rapidly as machinery could be had. New concerns, large and small, financed by local capitalists and backed by local banks, were springing into existence all through the embroidery district of East Switzerland and the Voral Mountains. Local machinery manufacturers were pushing production to the utmost limit, one concern alone having orders booked in October for 550 machines, and turning them out at the rate of 90 per month; and, the local supply not being equal to the demand, machines were being imported from Saxony in large quantities. Factories, unable to keep pace with orders for embroideries, competed with each other in bidding for "house work"—letting out their orders to small concerns and families operating one or more machines in a fashion peculiar to this district.

Technical papers and expert observers had, entirely apart from any anticipated disturbance such as came so suddenly from the United States, uttered conservative warnings, pointing to the unsatisfactory European markets, especially in Germany, to the impending Presidential election year in the United States, and to strained credits at home, so many of the new enterprises operating almost entirely upon bank credits. Nothing, however, availed to stop the rush until the American crisis, as it is here called, effected a sudden halt. Not a single failure has, however, so far occurred, although it is frankly admitted that many large and otherwise solvent concerns have been in straits for cash, to say nothing of the smaller and newer enterprises.

BUSINESS RECOVERY PROSPECTS.

Bank accommodations ceased, bank rates advanced sharply, no money was to be had for current American shipments, and altogether the situation was discouraging. It has been met philosophically and a much more optimistic feeling prevails now than four weeks ago. A consensus of opinion of leading manufacturers, many of them well conversant with American conditions, agrees in predicting an early partial and an eventual full recovery, based upon the excellent industrial as distinguished from the financial conditions in the United States.

Some canceled orders have, indeed, already been replaced, and it is confidently predicted that a normal and perhaps healthier business will soon follow. The effect upon prices is bound to be severe, and upon miscellaneous and house labor still more drastic. Ultimate effects are, however, purely speculative at this time.

Switzerland, as distinguished, for instance, from Austria and Germany, has no official chambers of commerce; but, similarly to the American method in such things, there are maintained in every trade center unofficial associations of leading business men for cooperative purposes. The St. Gall association—and the fact is perhaps the best illustration of the seriousness of the local situation—on December 4 took the unusual course of publishing the following announcement:

In its report for 1906, entitled "Commerce and industry," this committee predicted a set-back to the high point reached by machine embroideries, resulting in a change of white embroidery fashions. This expected set-back came sooner than anticipated—not through a change of fashions, but through a sudden and unexpected financial crisis in the United States. The crisis did not fail to have its effect upon the embroidery market, but it can be safely said that the solidity of the American firms which are chiefly consumers of our goods is beyond the question, and that the demand will continue. America has also just put under roof rich crops of cotton and grain, which she can dispose of at good prices. This presents the question: What shall we do? Nothing, but to keep cool and give the market time to return to its normal condition; to generally curtail production of staples until present stocks are safely placed, and, above all, not to circulate any alarming rumors or reports.

FRANCE.

[By CONSUL JAMES B. MILNER, CALAIS.]

The preeminence of the French city of Calais as a lace center is chiefly due to the cleverness of its lace makers. It should be borne in mind that a lace loom, although of the most intricate mechanism, is still only an instrument, the production from which depends entirely upon the ability and intelligence of its operator. Calais has ambitious citizens, among whom exists a spirit of rivalry and a desire to excel, not only financially, but in art. The greater part of the French people here believe in having something which they can call their own and are not disposed to let one man run everything. Their mental make up and manner of working render monopolies of an industry of this kind impossible. This characteristic alone, perhaps, has contributed more to the success of Calais in recent years than any other, since lace to be beautiful must receive in its fabrication the greatest care and attention, which is too often overlooked in a large concern. Calais has a population of 70,000, about 60,000 of whom gain their existence from lace making, yet very large concerns do not exist here. On the contrary, there are 650 small factories in Calais, in many of which the wife adds her intelligence to that of the husband in making the factory a success. Machine-made lace is almost the sole industry of Calais.

LACE SUCCESSFULLY PRODUCED IN AMERICA—TECHNICAL SCHOOLS.

That a lace machine can be operated successfully in the United States is no longer an open question. It has been tried by curtain manufacturers in Philadelphia and other cities, and also in the manufacture of lace in New York, Providence, Pawtucket, Paterson, and Zion City. Already the lace industry is of great importance in the United States. As proof of this the following statistics from a French source may be cited: For the fiscal year ended June 30, 1906, the United States consumed \$40,400,000 worth of lace goods, of which the home supply was valued at \$7,200,000; that from France at \$10,300,000; from Switzerland, \$11,200,000; from Germany, \$6,000,000; and from Great Britain, \$5,700,000. It thus appears that the United States made for itself 17.8 per cent of the lace consumed therein in 1906. Of the French shipments, \$7,420,715 worth, or 72 per cent, was from Calais. In this estimate account is only taken of the lace goods declared for shipment at this consulate, no

account being taken of some large houses which declared their shipments at other consulates. Should these be taken into account it would show that Calais, Caudry, and St. Quentin furnished at least 80 per cent of the lace goods shipped during the above year from France to the United States.

In Calais there is a technical school, under the supervision of Abbé Piedfort, which has for its object the training of young boys in the technics of the lace industry. This school embraces sketching designs, designing (i. e., reducing the sketch to the mechanism of the loom), lace making, "metteur en œuvre," and "regleur." The two latter are professions in the lace manufacture for which no English names have as yet been employed. The "metteur en œuvre" and "regleurs" may be said to be the mechanical doctors of the loom.

NUMBER EMPLOYED AND VALUE OF OUTPUT.

In Calais, Caudry, and St. Quentin there are in all about 1,040 factories. Their many looms turn out enormous quantities of lace, which, after it is dyed, has to be clipped of its surplus threads. The output of the largest factory amounts to about \$500,000 annually. It is difficult to give the output of an average factory, as they have from 1 to 60 looms.

As to the number of inhabitants who live wholly from the making of lace in northern France only an approximate opinion can be given, but it can be conservatively estimated at 100,000. The clipping of the surplus threads employs, irregularly, in the villages within 50 miles of Calais and surrounding Caudry and St. Quentin, another 100,000. Of course, as to these no accurate statistics can be had, but one visiting the many villages about Calais can see everywhere in every household women and girls engaged in clipping lace. In estimating the population engaged in and sustained by this industry no account is taken of the spinners of the threads used in the fabrication of lace. The spinning industry is enormous at Lille. Many fortunes have been made there spinning the thread for Calais, Caudry, and St. Quentin. Much thread also is imported from England. Merchants have, even in Calais, grown rich in furnishing lace manufacturers with thread.

The approximate output of the lace industry in Calais, Caudry, and St. Quentin is about \$20,000,000. The industry in the last three years has increased more than 50 per cent in Calais. Everywhere are to be seen proofs of this prosperity in the way of new buildings, new residences, automobiles, etc.

INCREASED EXPORTS DUE TO LACE INDUSTRY.

In a previous report relative to the machine-made lace industry of this city, in which a comparison was made between the exports of Calais and Nottingham, England, to the United States, a mistake

was made which did injustice to both Nottingham and Calais as to the amount of exports of these two industrial centers to our country. The exact statistics are therefore given herewith. In the following statement the figures for the fiscal years ended June 30 embrace not only lace, but all kinds of exports from these two cities :

	1906.	1907.	Total for both years.
Calais.....	\$7,430,714	\$9,318,991	\$16,749,705
Nottingham.....	6,279,614	7,510,255	13,789,869
Difference in favor of Calais.....	1,151,100	1,808,736	2,959,836

It can be seen that the total exports of Calais for the last two fiscal years to the United States exceeds the total exports of Nottingham for the same period, substantially, \$3,000,000. This showing in favor of Calais is due to the fact that in the past five years the lace industry has increased at least 50 per cent in its productive capacity and also to the favor with which Calais laces have been received in the American market.

ENGLAND.

[By CONSUL F. W. MAHIN, NOTTINGHAM.]

Nottingham is preeminent in the production of machine lace, for several reasons—first, the invention of the stocking frame in this county; second, the town was always noted for its mechanical skill, and a proverb runs that “The little smith of Nottingham can do the work no other man can;” third, the inventors and improvers of lace machinery were Nottingham men; fourth, the damp climate. Cotton-cloth making was first started in Nottingham, but was moved to Lancashire because the climate was not damp enough here, though right for lace making.

The machines now in use in the Nottingham lace industry are the Levers, lace curtain, plain net (all based on Heathcoat’s invention, with Levers’s improvements), and warp lace (an adaptation of the knitting machine). A German machine for making embroidered net and lace is used to a limited extent, and also the Barmen machine, of mixed German and French origin, producing a clever imitation of handmade lace. The product of the machine, being in a crude brown state, must be bleached and otherwise treated to render it fit for the consumer. These various processes closely followed in development the making of lace. Samuel Hall, of Nottingham, patented certain devices during several years, beginning with 1817, which are essentially those used to-day.

A GREAT NUMBER DEPENDENT ON THE INDUSTRY.

About 6,000 people are employed in the lace factories of Nottingham and immediate vicinity; in the bleaching and finishing processes, distinct from the factory work, probably 20,000 more are employed—the number being a variable quantity, dependent upon the state of the trade. The number directly dependent on the lace industry is estimated at 50,000, and the number indirectly dependent thereon is probably 125,000—half the town’s population. At least 600 firms are engaged in the industry in this city, in making, finishing, or marketing lace. A few combine the three, most of them both finish and sell, while a comparative few deal in the finished article only. The number of firms weaving lace is 135. The annual output of the largest factory is worth about \$1,000,000, and of an average factory about \$250,000.

Many of the lace factories are in the city limits, but the present tendency is to place new ones in adjacent villages, where land and labor are cheaper. The finishing processes, however, are confined to the city, on account of the better facilities and because trade is expedited by bunching close together the firms engaged therein. As a rule, lace factories are not occupied by one firm alone, but are let somewhat like tenement houses. Thus, there may be one firm or more on each floor, or one firm may have two or three floors. The rent covers all tenement expenses except lighting and insurance. Wages of factory hands range from \$4 to \$20 a week, depending on the skill or knowledge required. Their mode of living is much like that of other working people, though they dress rather more smartly, owing perhaps to the influence of their artistic trade. To this influence is also possibly due the fact that lace makers are notable gardeners. Many of them rent plots in the city allotment gardens, where they pass much of their spare time in cultivating flowers, fruits, and vegetables. [The consul's historical details of the establishment of lace making in Nottingham are filed for public reference at the Bureau of Manufactures.]

GERMANY.

[By CONSUL CARL BAILEY HURST, PLAUEN.]

The laces made here are known as "burned-out" or etched laces, which are laces embroidered on a thin woolen fabric. The animal wool is burned out by immersion in a chemical bath that leaves the vegetable fiber lace unharmed. When silk laces are to be made they are embroidered upon a vegetable fabric, which is generally removed by passing rapidly over gas flames, leaving the silk web uninjured.

The production of laces has increased enormously, and the life and wealth of the whole place is centered in the lace industry, which has almost a monopoly for etched laces. Some 5,000,000 designs of laces are supposed to have been carried out on the looms of this place, and the number is rapidly increasing. Every effort is made by Government and municipal aid to foster and improve the industry. There is a famous textile school here, where designers are thoroughly trained.

Due entirely to the tremendous growth of the machine-made lace industry, the city itself may be said to be dependent upon this article for its present commercial importance. To-day it has a population of over 110,000; less than fifteen years ago it numbered 50,000; and not many years before that it had not more than 20,000.

FACTORIES AND EMPLOYEES—EXTENT OF THE BUSINESS.

There are about 350 lace-manufacturing firms and 100 more in the surrounding smaller towns. There are probably not less than 30,000 employees directly engaged in the lace business, and, while some of the large factories have a world-wide reputation, there are many smaller ones, having only a few persons engaged. Buyers come from all over the globe to select for the great import houses. A number of the larger firms of Plauen have in turn their own agents traveling in every civilized country, as well as in some that are not so recognized.

The largest purchasers are England, France, and the United States, the latter having imported during the past year nearly \$5,000,000 worth of Plauen laces, on which the United States collected about \$3,000,000 in customs duties. Canada, Mexico, and South America

are also large buyers, while some \$20,000,000 worth of Plauen laces and embroideries were exported to all countries from Plauen in 1906.

At the caprice of fashion, the lace business is a very delicate one. Only limited stocks can be kept along staple lines, otherwise a change of vogue would render them unsalable.

WAGES OF THE OPERATIVES.

The wages paid to employees are small, according to American standards. While the many girls and women employed in the factories could earn as much in domestic service, they prefer the freedom and independence of factory life. Fifteen marks (\$3.57) a week is considered good pay, and nearly all wages are reckoned according to the amount of work done.

Stitchers are always men, who sit at the left of the looms and guide the so-called pantograph over a six-fold enlarged pattern on which the stitches are outlined. The loom responds instantly to every movement of the pantograph, and the stitcher is paid according to the number of stitches taken. Quick and experienced operatives receive, sometimes, \$20 a week.

Most of the cutting off and fastening of threads is done at home by children and women, who can be seen by the score sitting on the doorsteps and all about outdoors at work with scissors and thread, surrounded by masses of delicate lace, or carrying through the streets their bundles of laces to and from the factories.

With the highly developed machinery, all the fine, hand-made laces can be copied with marvelous accuracy, including Venetian point, Irish, Cluny, Brussels, and many others, as well as muslin embroideries and edgings of all sorts.

BELGIUM.

[By CONSUL-GENERAL ETHELBERG WATTS, BRUSSELS.]

Out of a total of 45,500 lace makers in Belgium, West Flanders has 25,500 and East Flanders 18,200. The art of lace making is still much followed among the Flemish population, who have shown great skill in all kinds of needlework. In certain districts it may be said that all women, young and old, handle the bobbin or the needle, and where the manufacture of lace has fallen back before the invasion of other industries it still possesses a certain popularity.

Lace is made at home, almost always by women, and is sold through local middlemen, who alone deal with the lace maker and who supply the so-called manufacturers or contractors. The lace makers work, as a rule, to order and by contract, and are paid by the piece. They reside mainly in the different villages of the provinces of Flanders, while the contractors are located in Ghent, Bruges, and especially Brussels.

Lace is divided into point and pillow lace, the latter so called on account of being made on pillows or cushions. Three essential agents cooperate in the manufacture: First, the commercial contractor or manufacturer, who centralizes the production of certain articles, for which he has received orders or the sale of which he foresees, which are almost entirely manufactured outside of his premises. He distributes his orders among his middlemen, and rarely supplies raw material. Second, the middleman or party who is between the lace maker and the commercial contractor, being sometimes an agent and sometimes a representative of a convent. Third, the lace maker, who works at home and never comes in contact with the manufacturer for whom she works. She receives her designs and pay from the intermediary agent.

EARNINGS OF THE LACE MAKERS—FUTURE OF THE INDUSTRY.

The majority of the lace makers earn from 50 to 85 centimes (about 10 to 17 cents) a day. Exceptionally good workers earn 1 franc (about 20 cents), and expert workers (of whom there are only 10 or 12 out of 15,000), 2 francs (38.6 cents) a day, for no matter what kind of lace.

The mother sometimes initiates her daughter in the manufacture of lace, which she has practiced herself from childhood, but as a

general rule no longer teaches the latter the trade, but sends her to the neighboring lace-making school, where the child is taught to make the lace she prefers. There are 160 schools for lace making and embroidering on tulle in Belgium, of which three-fourths are managed by nuns of the Roman Catholic Church.

Notwithstanding the success which Brussels lace has had, the future of the industry does not appear bright. Every year the number of lace makers decreases to an alarming extent. Events of an economical character, fashion, competition of the numerous mechanical imitations, especially those of Venice, of Chantilly, and of Valenciennes, and the defective commercial organization of the lace industry, have contributed to harm it. Owing to the system of intermediary agents, by which some agents grow rich and the lace maker receives barely sufficient wages to keep soul and body together, the trade is yearly becoming less and less popular, and lace makers are beginning to take up more profitable occupations.

There are about 191 firms engaged in the lace business in Brussels, but no statistics are available showing either the number of persons employed in the lace industry or the production of lace.

The exportation of lace from Belgium for 1905 amounted to \$1,278,627, and for 1906 to \$1,455,600. The exportation of lace from Brussels to the United States amounted to \$214,944 in 1905 and \$310,654 in 1906.

BRITISH INDIA.

[By CONSUL-GENERAL W. H. MICHAEL, CALCUTTA.]

The declared value of chikon embroideries exported from Calcutta to the United States during the calendar year 1906 was \$42,072. The value of shipments to other countries is not stated, but I learn from the men engaged in collecting and exporting chikon embroideries that America takes two-thirds of all shipped from Calcutta. As most of this work is done in Bengal it is probably within bounds to say that two-thirds of all chikon work exported from India goes to the United States under invoices issued from this consulate-general.

The lists and samples of chikon embroidery brought for inspection, with a view to invoicing shipments, are generally comprised of handkerchiefs, made of fine mull, waists, pillowcases, pincushions, infants' robes, children's frocks, pillow shams, bureau covers, pillow covers, tablecloths, tray cloths, silk gowns, sheets for bed covers, petticoats, strips of embroidery, mull petticoats, piano covers, ladies' underwear, centerpieces, etc. The silk dresses are generally of China silk, and the work, while not equal to the embroidery on silk done in Japan, is tastefully executed and the designs, while monotonous, are quite effective. Patterns in four and five breadths, 27 inches wide, are made and sold here at 15 to 20 rupees (rupee, 32.34 cents). Most of the embroidering on silk is done by men. The same kind of work on mull of suitable fineness and strength is done by men and women for 9 to 12 rupees.

Some of the most effective work of this kind done in Bengal is known as "bed sheets." These are simply bed spreads 9 feet long by 6 feet wide, on either cotton or linen, seldom the latter. These spreads are elaborately embroidered and sell for 10 to 20 rupees.

PRICES OF THE CHIKON WORK.

The cheapest handkerchiefs for ladies made of mull sell for 1 rupee 2 annas per dozen (anna, 2 cents), and the highest priced ones at 6 rupees per dozen; mull waists at 2 rupees 2 annas each; pillowcases, 7 rupees per dozen; pincushion covers at 2 rupees 4 annas per dozen; infants' robes, 2 rupees 8 annas; bureau covers, 2 rupees a pair; tablecloths, 6 by 8, 6 rupees each; mull gowns, 16 rupees each; pillow shams, 6 rupees per pair. These are the invoice prices, which are market quotations so far as it is possible to ascertain on days of shipment.

The men and women who do the chikon work receive very little for their labor. An article that requires six days to make, the artisan working ten and twelve hours a day, sells for less than a dollar, and out of this the man or woman whose toil produced the article receives, perhaps, less than 33 cents. Most of the chikon work is done when work on the farm is slack, yet some chikon work is done all the year round. The man who buys from the producers of chikon work spends sometimes six months or a whole year assembling enough of the goods to make up an invoice, which generally fills a medium-size dry-goods box. The articles are sent to Philadelphia, Charleston, New Orleans, and occasionally to New York. The buyers are natives of India who are very often relatives of the men who export the goods. The stores at the points named supply Indian dealers who offer the goods for sale at nearly all summer resorts. These dealers may be seen at Atlantic City and other places squatted on the floor with their chikon work and some Indian jewelry spread out in the most attractive manner. [Photographs of chikon work forwarded by Mr. Michael are filed for public reference at the Bureau of Manufactures.]

