

THE SILK INDUSTRY OF FRANCE.

We extract the following summary of facts and figures about the silk industry of France from a very pithy article from the practised pen of M. Alfred Renouard:—

(I.) Centres of French silk industry. People generally have no idea of the extent and importance of this industry. It is usually thought of as having its sole centre in Lyons. Of course, Lyons is what may be called the head of the line; it concentrates in itself the most diverse silk industries, it furnishes employment to the largest number of workers, and possesses the most important plant. But, nevertheless, there is a considerable amount of silk-weaving outside of its limits. Mention must be made, in the first instance, of the great silk industry of the Loire, represented by Saint Etienne for ribbons, Saint Didier-la-Scaveuse and Saint Chamond for lacets and passementerie; the industry of the Haute-Loire, the most important element in which is the lace manufacture of Puy; the silk hosiery manufacture, which has its seat in Aubie and Gard; the manufacture of mixed tissues in the north, represented by Roubaix, Bobain, and Amiens; the important tulle industry of Calais and Caudry; and lastly, the manufacture of furniture stuffs represented more particularly by Tours and Nimes. From the north to the south then silk is used in France; and if in the pure condition it has its principal seat in the region of the Rhone, and in some special centres, it may be said that in the mixed condition it constitutes for other regions, usually considered the seat of the wool and cotton industries, a useful adjunct, which enables them to dispose of their products more easily.

(II.) Sources from which silk is obtained. The following table shews at a glance the quantities of silk placed at the disposal of manufacturers in the year 1889, under the heads of the different countries from which they were obtained:—

France	595,000 kilos.
Italy	2,900,000 "
Austro-Hungary	230,000 "
Spain	65,000 "
Anatolia	215,000 "
Salonica, etc.	165,000 "
Syria	310,000 "
Caucasus	102,000 "

Total for Europe and Asia

Minor	4,582,000 kilos.
China	5,479,000 "
Japan	2,160,000 "
British India	400,000 "

General Total for 1889..... 12,621,000 kilos.

(III.) Silk used by France. The figures for French commerce so far as raw silks and thrown silks are concerned are as follows:—Raw silk imported, 3,378,000 kilos.; thrown silk imported, 426,000 kilos.; silk produced in France, 595,000 kilos.; total of silk presented on the French market, 6,399,000 kilos, or a little more than one half of the quantity supplied to the world.

(IV.) Value of goods produced at different centres of the French silk industry.

Lyons	385,000,000 francs.
Saint Etienne	103,000,000 "
Saint Chamond	12,000,000 "
Calais and Caudry	93,000,000 "
Tours	7,000,000 "
Nimes and Le Puy	8,000,000 "
Troyes	12,000,000 "
Roubaix Bohain and Amiens.....	25,000,000 "

Total..... 299,000,000 francs.

These figures are taken from the least questionable sources—those relating to Lyons, for instance, were supplied by the Chamber of the Silk Syndicate of that city in 1888, and those referring to the industry of Saint Etienne were furnished by the Chamber of Commerce of that town in reply to the enquiries of the Superior Council. It is proved then that the total production of tissues of French manufacture in silks, pure or mixed, attains the sum of 645,000,000, or more than half a milliard.

(V.) The number of persons engaged in the French silk industry:—

Lyons	300,000
Saint Etienne	75,000
Saint Chamond	5,000
Calais and Caudry	24,670
Tours and Nimes.....	9,000
Le Puy	15,000
Troyes	4,500
Roubaix, Bohain, and Amiens	21,000

Total..... 452,170

These figures also have been taken from the best authorities. Of course, they include only workers who work during the whole year.

(VI.) Wages paid to French silk workers:—

Lyons	192,000,000 francs.
Saint Etienne.....	45,900,000 "
Saint Chamond	2,500,000 "
Calais, etc.	31,500,000 "
Tours, etc.	5,000,000 "
Le Puy	2,500,000 "
Troyes	3,000,000 "
Roubaix, etc.	13,000,000 "

Total..... 299,000,000 "

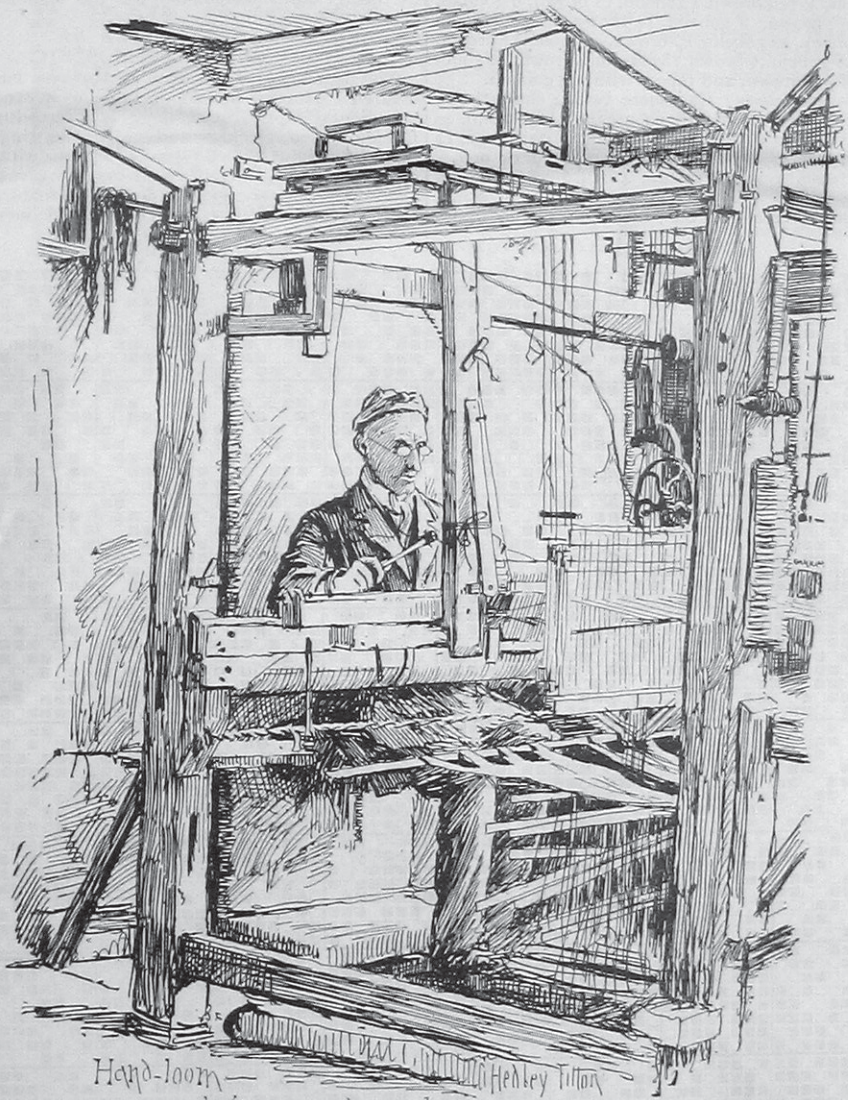
(VII.) Value of fixed plant:—

Lyons	106,000,000 francs
Saint Etienne.....	31,000,000 "
Saint Chamond	20,000,000 "
Calais, etc.	51,000,000 "
Tours, etc.	8,000,000 "
Le Puy	8,000,000 "
Troyes	1,500,000 "
Roubaix, etc.....	16,000,000 "

Total..... 233,500,000 "

THE SILK INDUSTRY OF MIDDLETON.

Our enterprising contemporary, *The Manchester Weekly Times*, to the proprietors of which we are indebted for the loan of the illustrations which appear below, is giving a series of special articles descriptive of Lancashire towns. These sketches have attracted a considerable amount of attention throughout the north, and from that which appeared last week on Middleton we make some extracts relating to the silk trade of the town. The goods produced there at the present time are chiefly umbrella silks and smallware goods, such as hatters' trimmings. The trade, such as it is, is principally in the hands of Messrs. Fitton and Mee, Robert Hilton, Henry Kay and Co., S. and G. Scholes, and J. and I. Thorpe. Silk weaving at one time was the staple industry of the dis-



Hand-loom weaver at work

THE ALLEGED DRIVING IN WEAVING SHEDS.—Messrs. Jas. Mawdsley and T. Birtwistle, chairman and secretary of the United Textile Factory Workers' Association, have addressed a circular to each of the members of the Standing Committee on Trade, asking them not to accept Mr. Oldroyd's amendments to sections 83 and 87 of the Factory and Workshops' Bill, as they would, in practice, create a considerable increase in the hours of labour of women and children. They point out that certain small jobs can be put off until the engine stops running; so as to keep the machinery in motion as long as possible. They quote from the report issued in 1873 by Drs. Bridges and Holmes, in which it was stated that both by a spirit of emulation and pressure on the part of the overlooker female women weavers are goaded into doing the greatest amount of work possible in a given time.

trict, and the industry first began to expand at a time when the starving hand-loom cotton weaver was searching vainly for remunerative employment. Fifty years ago there were 22 silk throwing machines in Lancashire alone, employing about 3,600 hands, and Manchester was able to obtain the preference over Spitalfields in the selection of a silk damask to furnish an apartment in Windsor Castle. From silk handkerchiefs and unions, which formed the principal items in the silk-production of the city in the early days of the industry, the manufacture extended until Gros de Naples and figured goods were woven extensively. Of late years the encroachments of cotton have practically driven the silk business from Man-

chester, and it is only in such outlying districts as Leigh and Middleton that the industry can be said to survive. The following is from the *Weekly Times* :—

Middleton, though it has been a seat of the cotton industry for a considerable part of the century, was, until comparatively recently, much less a factory town than some of its neighbours. It was, in fact, for many years an important silk weaving centre, and the industry has not yet been entirely driven out of the town. But while formerly the hand-loom silk weavers included a considerable proportion of the population, they are now confined to a few families. The weaving was carried on in cottages, many of which may still be seen in various parts of the town, with the rooms specially built for the looms; and as it is not probable that silk weaving under these conditions will be carried on for a very long period, the old arrangements, and their influence on the manners and habits of the people, are well worth studying. The weavers go to the Manchester warehouses for the spun silk, and when their work is finished they bring back the woven pieces. In old times it was a familiar sight to see men going backwards or forwards along the roads to Middleton or Failsworth carrying heavy packs on their backs, but

loom silk weaving has survived that of cotton, the changes in the circumstances of the trade have for a long time caused a diminution in the number of those engaged in it in this district. But while the compensating advantages of the factory system should not be overlooked, and its importance as a factor in the prosperity of the place not forgotten, it will be admitted that something has been lost in the gradual absorption of the older and homelier industry by the mighty mills and the wonderful machinery worked by steam power.

REUTER, telegraphing from Mezieres on Saturday last, says the strikes in the valley of the Meuse and in the Ardennes are extending and the weavers' strike has now reached an acute stage. The same state of affairs also prevails in various other districts.

MR. W. S. CAINE ON FACTORY LEGISLATION.—Mr. W. S. Caine has replied as follows to a correspondent on the subject of Indian factory legislation :—
1, The Terrace, Clapham Common, S.W.,
April 16th, 1891.

MY DEAR SIR,—You will see by the enclosed that your letter is not signed.



Winding Bobbins

now the railways prevent these long tramps. The division and distribution of labour in this system had a very important effect on the family life of those concerned, and its tendency certainly was to strengthen domestic relations to an extent scarcely permitted under the factory system. The members of a family worked together under one roof, and in the same group of cottages relatives and friendly neighbours shared the same occupation. Parental control was firmer, and probably more enduring; and there was certainly greater unity of sentiment and more general sympathy between the different members of the same family than is common now. For many years it was possible to notice the effects of the two systems; when the factories were built young people were soon attracted by the higher wages, and, what was deemed almost as great a privilege, the greater independence. The girls who went to the factories worked shorter hours, and generally claimed their liberty when the mills closed; new associations were formed, and the old home attractions were not sufficient. In any case the struggle between the two industries and two methods would have been an unequal one; and though hand-

As far as I can judge from a careful perusal of the main body of the evidence given before the enquiry which preceded the Indian factory legislation, there was no real agreement of opinion among the operatives. As I dare say you know, I visited a good many of the mills, and made some careful enquiry into the whole business, and I was quite satisfied that there is really no opinion to be got. The operatives greatly prefer to have the mills open from sunrise to sunset, and to do their work during a long stretch of time, and in their usual drawing fashion. The fact of the matter is that factory legislation in India proceeds on altogether different lines from what it does here. Here it is possible to obtain thoroughly sound opinion from the hands themselves; in India the Government cannot do much more than pass legislation which they believe to be generally beneficial in the absence of any very authentic opinion from the hands. It is a very difficult subject to write about: it is wide and complex, but if some time when you see I am down in Bradford for a few days you would let me know, it would give me great pleasure to meet you and talk over the subject with you.—Yours very truly,
W. S. CAINE.

Bleaching, Dyeing, Printing, etc.

PAPERS ON BLEACHING.—XIV.

(Continued from page 295.)

No account of the bleaching of cotton is complete without some mention of the Mather-Thompson bleaching process, and of the Mather steamer kier. About 1884, Mr. J. B. Thompson described in *The Dyer* a process which he had developed for bleaching cotton by first boiling the fibre in caustic soda, then subjecting it in a closed kier alternately to the action of chemic and carbonic acid gas. This process was shewn in action at a meeting of the Manchester section of the Society of Chemical Industry, and was favourably commented on at the time. As with a good many other processes, which work well on a small scale in the hands of the inventor, this new process was in the form it left Mr. Thompson's hands quite unfitted to bleach cotton on a large scale, owing to mechanical difficulties. However, Messrs. Mather and Platt, of Salford, took it up and developed the mechanical part of the process, with the result that quite a new form of kier was introduced: the Mather steamer kier, which is not only applicable to the Mather-Thompson process, but can be applied, and is, indeed, largely used in combination with the ordinary process of bleaching.

The most important part of the new process is the steamer kier. This resembles the ordinary steam boiler, and is placed, like it, horizontally. One end is closed, and the other end is open for the purpose of charging the kier with the goods. This end can be closed with a door made to be raised or lowered by a simple but ingenious arrangement, which permits this operation to be done with a minimum of power, and the door being made wedge-shaped, closes the kier automatically, and is perfectly steam tight. The goods are not piled into the kiers direct, as is usual, but into waggons with skeleton sides, and these, when filled, are run into the kier. This system enables the work to be done more rapidly. By having duplicate waggons, one can be emptied and filled again while the other is in the kier filled with goods being treated. When the waggons are filled with the goods, which, in the case of cloths, may be open or in a rope form, the latter are first saturated with a boiling weak solution of caustic soda, of say about 2 to 4° Tw., which will contain about $\frac{1}{2}$ to 1 lb. of soda in 10 gallons. When this is done the waggons are run into the kier, which, it may be mentioned, is constructed to hold either one or two waggons, according to the quantity of material which is required to be turned out in a given time. The door is closed, then the hot caustic liquor is pumped over the goods. This is continued during the whole period of the operation, so that there is a continuous circulation of soda liquor through the kier and over the goods all the time. Steam at about 4 to 5 lb. pressure is sent into the kier, and in about five hours the operation is finished. Steaming cotton goods, which had been treated with caustic soda, had been done before, but it was found to tender the goods. This was because the goods were only steeped before steaming, and during the operation they got dry, and thus became tendered by the action of the caustic soda, aided by the high temperature to which they were subjected. On this account steaming with caustic was not a success, and was discontinued. In the Mather kier, however, by the continuous circulation of the soda liquor, the goods never become dry, and so they do not tender. The liquor is distributed in a very uniform manner over the whole surface by means of sprinklers. It then flows through the goods in the waggon and out of the kier into a cistern, whence it is again pumped up on to the goods.

After being thus treated the goods may either be passed through the remaining operations of the ordinary bleaching process, or treated in the Mather-Thompson continuous bleaching