

#### THE MANUFACTURE OF LINEN IN IRELAND.

**D**URING the first three months of the year 1889, says a writer in the *Canadian Manufacturer*, the importations into the United States of manufactures of flax aggregated \$7,445,199, and the importations of flax and substitutes thereof, unmanufactured, aggregated \$6,086,957, a grand total of \$13,532,156. This is at the rate of over a million dollars a week.

The soil and climate of both the United States and Canada are quite as well adapted to the successful cultivation of flax as is that of Ireland, Russia and Germany, and yet the industry on this side of the ocean is almost entirely neglected, or carried on in such a desultory manner that it can scarcely be taken into account when considering the extent of it in these two countries. It indicates an astonishing short-sightedness on the part of Canadian and American farmers and manufacturers that flax is not more extensively grown, for it could be always counted on as a sure crop that would produce an average of about fifteen bushels of seed

per acre, worth a dollar a bushel: two and a half tons of flax straw worth \$20 per ton, from which could be produced a thousand pounds of flax fibre, worth \$200 a ton. It would seem to any thoughtful person that this is a matter worthy of consideration.

The flax industry in Ireland is an old one; for the Milesians who conquered Erin thirteen hundred years before Christ, introduced there a knowledge of the cultivation of flax and also the art of spinning and the manufacture of linen fabrics. In the Irish Book of Rights it is recorded that among the tributes paid by the provincial kings were garments of linen, embroidered in colors and with threads of silver and gold. In the days of Saint Patrick the art of weaving and embroidery had attained what was then considered a high state of perfection, and history tells us that that good man himself gave constant employment to three noble ladies, one of whom was his sister, another the daughter of a noble of high rank, and the third a daughter of the King of Ulster. Eochaidh, one of the ancient Irish kings, was himself a cloth designer who introduced the weaving of various colored cloths, by which the social rank of all wearers might be known. Five hundred years before the Cromwellian Commonwealth hand linen spinning and weaving had reached a perfection in Ireland not surpassed in any other country, but the wars which devastated that unfortunate island for nearly a hundred years almost wholly destroyed the industry; and it was not received until the revocation of the edict of Nantes drove large numbers of skilled artesans and their families from France to Ireland. Many of these settled in the counties of Antrim, Armagh, Down and Tyrone, where they found employment in the towns of Belfast, Lisburn, and Lurgan.

Wet spinning of linen yarns was begun at Belfast in 1830. Previous to that time three-fourths of all the yarn used in weaving linen was made on the ancient spinning-wheel, in the homes of the cotters and farmers among the peasantry. A woman servant was not only expected to accomplish her every day household duties, but in addition she must spin a certain amount of yarn weekly. Mothers, daughters, and even the old grandmothers had their allotted hours at the wheel, and its buzz and hum were seldom missing from the cabin save during hours of sleep. The women of Tyrone were most famous in all Ireland as spinners; and their "kemps," or spinning matches, often plunged a whole townland into excitement. So late as 1850 only 58 power-looms for linen weaving were in use in Ireland. In the intervening years the increase in importance in every branch of linen manufacture has been marvelous. The amount of capital invested in this industry alone in and about Belfast, exceeds \$110,000,000. Thirty-five spinning-mills, with over 850,000 spindles, and about the same number of weaving-mills, driving 25,000 looms, are in operation. These employ in all capacities more than a hundred thousand persons; and more than four thousand male and female operatives may be seen at work in one establishment in the city of Belfast every day in the year.

In all the world there is no agricultural product so rich in labor, from seeding to the ultimate of preparation for use, as flax. To begin with, the preparation of soil requires more labor than for any other sown crop. Before flax-fibre is marketable by the farmer several distinct labor processes are necessary. Weeding, a slow, laborious process, is the first one. Then comes the pulling and sheafing, or gathering the flax into "beats" in the field. After this it is carted to the "steep-pond" and "rotted" or "steeped" from eight to ten days. Then the wet and sticky stuff is again carted to the field or "spread-ground" and carefully dried. "Lifting" and "stooking" follows this, so that the flax may be again got into sheaves and "capped," as with the "grain-shocks" of America, for additional drying and curing. It stands in these for some time, and is then taken to the "scutch-mill," where the roots, branches, withered bolls, woody heart, and flinty outer sheath are removed. The fibre comes from the "scutch-mill" in wisps, or "strikes," containing about one and one half pounds each. These are tied with a twist of the fibre into stone or fourteen-pound bundles, and are ready for the little Irish market towns where the flax factors, or buyers, pay the farmer about six shillings per stone for it.

The conversion of this flax fibre into thread for the weavers' use involves an interesting series of processes, and in these great spinning mills of Belfast they are all carried on under one roof. The first process is termed "roughing." The fibre is still filled with flinty slivers of flax-sheath. These are removed by drawing the flax through coarse steel combs, wholly a manual operation; and lads of from fourteen to eighteen years of age, called "roughers," are employed. It is stifling, dreadful work, the air being filled with myriads of almost impalpable particles pointed like steel. The constant inhalation of these soon produce consumption and other fatal lung diseases. For the privilege of existing awhile under these circumstances "roughers" are paid about nine shillings per week. The next operation is one of a similar nature, called "hackling." Straightened in steel clamps, the fibre is further cleaned and combed by concentric steel teeth revolving towards each other. Machine tenders, called "screwers," lads from eight to twelve years old, are paid from five to seven shillings per week for this work. The bunches of flax taken from the machines by other lads are laid crosswise in wooden frames. When one of these is filled it is called a "tipple of flax," and the "tipplers" are paid eight shillings per week.

The next process is effected in the sorting room. This is filled with benches, each provided with a stationary double steel hackle or comb. A very coarse one "opens up" the bunches of flax without breaking the fibre, and a much finer one is used in finishing the combing and dressing. Flax "sorters" are undoubtedly the most skilful men connected with any branch of linen manufacture. Their deftness in dressing and sorting is truly marvelous. Half-a-dozen different grades of weight and color are often found in one bunch of flax, but when the silken stuff leaves their hands there is not a particle of variation in weight or shade in the shining, hair-like piles before them.

The utmost these sorters are permitted to make is twenty-five shillings per week. All the subsequent processes are in the hands of girls and women. The sorted flax is carried to the "spreading machines." These are provided with boards over which straps, moving at the speed of eighteen inches per minute, run between cylinders to "spread" and "blend" different desired grades of dressed flax. A girl standing at the right of each machine supplies or spreads these never-halting straps with little wisps of differently-graded fibre so laying each wisp on each strap that an even quantity is constantly being received by the cylinders. This work is done with incredible rapidity. Proficiency requires years of practice but the wages are but eight shillings per week. The flax is delivered from the "spreaders" into cylindrical cans in continuous shining "slivers," looking for all the world like a thin ribbon of confectioner's taffy. Automatic indicators ring bells when a certain desired quantity has been wound into the cans. These are removed for the fifth process to the "drawing" rooms, where machines, attended by women, double and "draw out" the "slivers" of fibre, until when it leaves this process, in round numbers, fully 20,000 "doublings" of the fibre have taken place; all for the purpose of "levelling," or evening, the "sliver" before spinning. The next operation is that of "roving," where from sixty to eighty "slivers" are run through each frame, and wound by machinery upon spools into "roves" ready for the spinning-machines. The women thus engaged are known as "rovers," and earn from seven to eight shillings per week, set wages. The seventh and last process in the manufacture of linen yarns is spinning. This is so well known that extended description is unnecessary. The great machines are fed from the "roves" just mentioned, the flax "slivers" passing through boiling water over brass rollers to the spindles, which make from 4,000 to 6,000 revolutions per minute; the spun thread passing from spindle to spool with such vibration and speed that it is scarcely visible to the eye. All spinners are women.

The struggle for life of these operators is pitiable. They are taken on as "helpers" at ten years of age, and are allowed to work every other day for two shillings ninepence per week. From three to five years of such labor are required to make them "full spinners," when they receive only from eight to nine shillings per week. For reasons which are claimed as necessary, they are compelled to labor in rooms at a temperature of ninety degrees, and

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manufacturers themselves say that the escaping steam, the dreadful odor of hot oils, the foul air and the intense heat, kill fully thirty per cent. of all spinners before they reach twenty-five years of age. These poor beings live and dye in ignorance of any personal comforts—shelter, food or raiment—yet it is upon them that those who indulge in the luxury of fine linen must largely depend for what they use.

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