

ing population to filth and slavery of the most degrading kind; while ponds, streamlets, and rivers are so polluted as not only to destroy fish, but to be unfit for being used by cattle, and while the atmosphere of the country during the period in question is pestilential to its whole population.

Among the first improvements from this state of things was that made by M. Schenk, who accelerated the process of fermentation in the separation of the flax from the boon by heated water, the water being gradually heated by steam in large vats, into which the flax is steeped. When removed from them, it (the flax) is dried in a "hydro-extractor," by means of centrifugal force. The hot water, however reduced the strength of the fibre, while the drying process allowed offensive gummy matter to adhere to it. To obviate these, Mr. Pownall, instead of drying the flax after fermentation, subjected it to mechanical pressure while in a wet state, and the action of a stream of water for removing the deleterious adhesive matter. Mr. Watt followed by a still more successful process of maceration. According to it, "the flax straw is delivered at the works by the producer in a dry state, with the seed on. The seed is separated from the straw by metal rollers, and afterwards cleaned by fanners. The straw is then placed in cast-iron close chambers, with the exception of two doors, which serve for the purpose of putting in and discharging the straw. The top of these chambers serves for the purpose of a condenser. The straw is laid on a perforated false-bottom of iron, and the doors being closed, and made tight by means of screws, steam is driven in by a pipe round the chambers and between the bottoms, which penetrating the mass at first, removes certain volatile oils contained in the plant, and afterwards is condensed in the bottom of the iron tank, and descends as a continuous shower of condensed water, saturating the straw. This water is a decoction of extraction matter, to which attach the fibrous and more porous portions. This liquor is run off from time to time, the more concentrated portions being used along with the chaff of the bolls for feeding cattle and pigs. The process is shortened by using a pump, or such an arrangement as rapidly washes the mass, with the water allowed to accumulate. In about eight or twelve hours, varying with the nature of the straw, it is removed from the chambers, and having been robbed of its extraction matter, it is then passed through the rollers, for the purpose of removing the epidermes or skin of the plant, and of discharging the greater part of the water contained in the saturated straw, and while in a wet and swollen state, splitting it up longitudinally. The straw then being free from all products of decomposition, is easily dried, and in a few hours ready for scutching." The Society for the Promotion of the Growth of Flax in Ireland appointed a committee to investigate Watt's process thoroughly by experiment, and their report speaks in the most favourable terms, as the following results show:—

Tons of Fibre.

"100 tons of straw by Schenk's process yielded 5·90  
100 tons of straw by Watt's process yielded . 12·20"

But great as these results are, Mr. Davy, by the mechanical means already stated, greatly shortened the process, increasing at the same time the quantity and quality of the flax.

Lastly, we come to Burton and Pye's improvements specially under investigation.

Under this practice, the flax is harvested under what is technically termed the "Courtrai" system—*i. e.*, after being pulled, it is dried in the field, and then stacked up till the following spring, after which it can be used as required for market. When taken from the stack, the boon is separated from the flax by Davy's machine. The boon, usually considered refuse, or waste, is then ground into meal, under the first head of the invention, mixed with linseed, boiled in water, and formed into cakes similar in size and shape to oilcakes, and used in the same manner as they are, for feeding cattle. The patentees believe that ordinary millstones are the best adapted for grinding the boon into meal; and, when found serviceable, other substances than those mentioned may be mixed in the compound.

The second part of the project consists in treating the fibrous part of the flax-plant with fuller's-earth. For this purpose, the flax is subjected to the action of water impregnated or combined with this well-known bleaching substance and with steam, and then boiled in water. During this latter process, it is alternately pressed close together, and allowed to expand. The water being now drawn off, the flax is allowed to stand for a time under pressure, after which it is passed between pressing and crimping rollers, for the purpose of removing the effects of crimping. During these pressing and