

substance, which unites it to the woody part. No mechanism whatever can clear the rind from this substance, and still less the woody stem, which also contains it."

In the Pas de Calais, where hemp grows only to the same moderate height which it attains in Great Britain, the stems are not scutched or beaten, like flax, to obtain the fibre, but it is peeled off by hand. This work is performed during their evenings, by work people, together with their whole families, who employ themselves in hemp-peeling when their day's work is done. A child of four or five years old is capable of executing the task. The head of the hemp stalk is simply broken with the fingers, and the whole of the fibre comes away with it at once. The string of fibre is thrown on one side, and the denuded hemp stalk is cast on the other to make sulphur matches with, for which purpose it is in great demand, the consumption for pipe-lighting being enormous in France. The match makers buy their bundles of naked stalks in pairs, one bunch of male, and one of female stems, that is, of shorts and longs. Each individual can earn two *sous*, or a penny, per evening by hemp peeling. The people are satisfied if it pays them for their candle and their tobacco.

PART III.

ROPE-MAKING.

It has been long discovered that we may obtain length by twisting fibres together, when they press upon each other, so that any single fibre is unable to overcome the resistance caused by the friction upon it of surrounding fibres. It will then break more readily than slip out from the mass. By this means a certain degree of compactness is also obtained, so that the infiltration of water is prevented, and the rope preserved from decomposition. Though a certain degree of twist is essential, any excess is injurious; for a rope may be so twisted as to break in the operation, and therefore a rope, brought up to this point without breaking, would be unable to bear any further strain, or to support any weight at all, and consequently be useless. Great precautions are therefore necessary in twisting the fibres, so that they shall retain as much as possible of their original strength, and be preserved from sustaining any further injury.

In making a rope, the first operation is to twist a certain portion of the fibres into a thick thread, which is called a *yarn*. These yarns vary in size, from one twelfth to a little above one-ninth of an inch in diameter. They are then *warped*, or stretched so that they may bear any strain equally. The next process is to twist a number of yarns, say from fifteen to twenty-five, into a *strand*. The twist of the strand is in an opposite direction to that of the yarn of which it is composed, in order that any tendency in the yarns to untwist may be counteracted by an opposite tendency in the strand. Three of these strands are formed into a *rope*, and three ropes into a *cable*. The term rope is generally confined to those which are above an inch in circumference; those which are less being called *twine*, *line*, and *cord*; though some of the latter terms are used with less strictness, as *fishing lines* and *clothes*