

HORSE-POWER DITCHING MACHINE.—Mr. Charles Bishop, of Norwalk, Ohio, has invented and taken measures to secure a patent for a good improvement in Ditching Machines, whereby the old spade method of ditching by manual power is entirely thrown into the shade. His machine is worked by horse-power, and is provided with a revolving excavator, the shaft or axle of which, lies in the direction of the length of the ditch. The excavator is of a screw form, and is operated by an endless chain. The ditch is cut of a semi-circular form, and it deposits the cut clay of other kind of excavated earth in a box, from whence it is delivered at one side of the road, by scrapers attached to the endless chain, the machine being propelled forward by a friction wheel or roller, moving in the ditch and operated by the excavator shaft.—*Scientific American*.

ON THE CULTIVATION OF HEMP.

Hemp requires for its growth a soil of deep rich, moist alluvium, such as is found in the best parts of Lincolnshire, where the ingredients of the earth are numerous, finely comminuted, and very intimately mixed. It will thrive on friable loams, and on loamy sands, provided the culture be rich, and the manuring abundant. On the latter soils the produce is not so abundant as black rich moulds, but the quality is finer, and can be used for more valuable purposes. The land must be very perfectly cleaned and heavily manured, or made very rich by the previous cropping. If freshly manured, the quantity may be 16 to 20 loads of dung on an acre. On this rich and pulverised surface, two bushels of Hemp seed are sown by the hand in broadcast, during the two first weeks of the month of April, and covered by a light and gentle harrowing. The heaviest and brightest colored seed should be selected, and some of them should be cracked to see if they have the germ perfect. Birds must be scared from the sown ground till the plants appear. It has been practised to hoe the crop, setting the plants at 12 to 16 inches apart, cutting down all weeds, and repeating the hoeing at the distance of a month or six weeks; but when the culture of the land is proper, the plants very soon cover the ground and kill every weed.

In about four months after sowing, the plants of Hemp turn yellow in the leaves, and the stalks become white, when the crop is ready to be pulled. When thread only is intended, without any regard to seed, the whole produce is pulled at once; when ripened seed is grown, the male plants are first pulled, usually in August, and the female ones afterwards, in the beginning of October, when the seeds are seen to be ripe. In both ways the stems are tied in bundles of about a yard in diameter, and with a rope at each end. The crop is then conveyed to the steep of water, in order to undergo the operation of water-retting. The bundles are placed in rows crossing each other, and are kept under water by blocks and logs of wood. It soaks generally from four to ten days, if the weather be warm; if not, five or six more, till the outside easily rubs off. It is then spread out singly on the grass, and turned, if there be showers, thrice a week; if not, twice a week. This is called grassing, and requires five or six weeks. It is then tied up in large bundles, and carted to a barn or house for breaking, by a machine called a "brake;" this is either done directly, or the bundles are laid up to dry for the future purpose. The Hemp being beat and broken by the hand or mill, is dressed or combed, by being drawn through hickles or heckles,

resembling wool-combers' tools, only fixed. The Hemp that is broken off by the operation is called "shorts;" this is bound up by itself, and is about the value of the long Hemp. The offal is called Hemp sheaves, and makes good fuel. Sometimes the Hemp is dressed to one quality of fineness, or it is made into two or three sorts, as the demand of purchase may direct. The heckler sells the Hemp to be spun for thread, or himself applies it to that purpose. Being converted into yarn, it is sent to the "whitester," who returns it in a bleached condition.

The female plants of Hemp produce the ripened seeds, and for that purpose remain longer on the ground. The pulled bundles of tied stems are staked up or housed till the seed be threshed out. In the spring (January or February) the stems are spread upon grass, and if the season suits, particularly if covered with snow, it will soon come a good colour, and make a strong coarse cloth; but it is much inferior to Hemp pulled in proper time, and water-retted or steeped. Although Hemp, in the process of manufacturing, passes through the hand of the breaker, heckler, spinner, whistester, weaver, and bleacher, yet many of these operations are frequently carried on by the same person. Some weavers bleach their own yarn and cloth; others their cloth only. Some heckle their tow and put it out to spinning; others buy the tow and put it out; and some carry on the whole of the trade themselves. When the trade is conducted by different persons, their interests often clash. By under-retting the Hemp, the grower increases the weight; by slightly beating it, the heckler increases the quantity of tow, but leaves it fuller of bark; by drawing out the thread beyond the staple, the spinner increases the quantity of yarn, but injures the quality; by forcing the bleaching, the whitester increases his profit, but diminish the strength of the yarn. In general, in manufacturing cloth, strength is sacrificed to fineness and colour.

The average produce of an acre of Hemp may be estimated at 40 stones, or £16 in money. The expense per acre may be about £10, leaving £6 for profit, along with seed (£4).—J. D.

DRAINING BY MACHINERY.

A series of interesting experiments have been lately made at the farm of Mr. Ruck, Down Ampney, Gloucestershire, for the purpose of proving the superior advantages of draining land by machinery, both in time, and expense, as compared with manual labour. The machine is an invention of Mr. Fowler, of the firm of Fowler and Fry, of Bristol. The field selected for the experiments consisted of stiff clay land, exceedingly dry on the surface, and crossed by a gravel path. The machine is formed by two horizontal iron frames, nine feet long, placed two feet apart, supported at one end by three wooden rollers, of one foot diameter, turning on axles; at the other end by two cart wheels. At the end nearest the cart wheels, and between the two frames, is supported a perpendicular plough or coulter of iron, seven feet in height, nine inches broad, and three quarters of an inch thick; the side of this plough or coulter, intended to cut the drain, has a sharpened edge, the other side is formed into a rack, which can be raised or depressed at pleasure, by a pinion or wynch, working into it, so that the plough is capable of being placed in the ground at any required depth. At the bottom of this upright plough or coulter is a socket, in which is placed a lengthened horizontal cone or plug, the