

effective reaping machine," and though not successful, after several trials, Mr. Smith received from the club a piece of plate of the value of fifty guineas, besides silver cups, and a gold medal from Russia. This machine appeared at intervals with different modifications until the year 1835, when it worked very successfully at the meeting of the Highland Agricultural Society at Ayr. At that trial it consisted of a revolving cutter, $5\frac{1}{2}$ feet diameter, composed of thin steel segments bolted to an iron ring, and the gathering of the cut grain was effected by two rakes placed on an upright cylinder, just above the cutter, which brought it off in a regular swath. It was used with two horses, working behind the machine, and cut a space $5\frac{1}{2}$ feet wide. In 1815 a Mr. Scott, of Ormeston, made a reaping machine somewhat similar to Mr. Smith's, but it received no encouragement, and shared the same fate as its predecessor. In 1820 or 1821, a Mr. Mann, of Raby, in Cumberland, invented a machine on a similar revolving principle, but the cutter was twelve-sided, instead of circular, and was used with a skeleton cylinder over it with rakes; but revolving independently, containing twenty-five rakes each having ten teeth of six inches long. A fixed comb was placed so that its teeth alternated with those of the rakes, and as the revolving cylinder turned once for seven times of the cutter, this fixed comb took the straw from the rakes at a certain part of the machine and deposited it in a swath. Unlike other inventors who had used the same form of cutter, he placed the horses before the machine, and they walked by the side of the standing grain, as with the machines at present in use. One horse in this machine cut down a breadth of three feet, and might average about seven acres a day.

In 1822 a Mr. Ogle, of Rennington, near Alnwick, invented a reaping machine which worked upon wheat and barley, but as it received no encouragement, only one was made. A description and drawing of it were published in 1826 in the fifth volume of the *Mechanics' Magazine*, and it is rather a remarkable circumstance that it answers in almost every particular to McCormick's machine that was invented ten years later and at the distance of 5,000 miles. In 1826 the Rev. Patrick Bell, Minister of Carmylie, in Forfarshire, invented a machine which has been used on his brother's farm ever since 1828, and which, in several trials, has proved fully equal to the American ones. It is pushed by two horses from behind, and its principles of action consist of a fixed bar of iron in front, to which are attached thirteen fixed shear blades, and twelve moveable ones are attached by a joint belt, and prolonged backwards in a tail-piece, till each rests in the revibrating bar between two pegs, which serve as a secure but simple loose joint; the cutting blades are fourteen inches long, sharp on both edges, and as the hind bar vibrates backwards and forwards, the

edges clip together like scissors. There are revolving vanes in front to catch hold, and retain the grain against the onward pressure of the cutter, but chiefly to assist in laying the grain on the endless web. The web conveys the cut grain to right or left, and delivers it upon the ground in a regular swath. The manner in which the driving wheel causes the endless web and the vanes to revolve, and the knives to vibrate, all at different speed, though simple, could only be understood from a plate. The machine cuts down a width of six feet, and as it is wrought from behind, can cut the grain in any direction without any previous opening being made for it. Professor Wilson in his speech at the Provincial Exhibition at Hamilton in 1853 states that "in 1835 five of these machines were made at Dundee, Scotland, and brought over to this country, and that some time afterwards Hussey's was brought out—the same as Bell's, with some few alterations." Though neither Smith's nor Bell's machines were generally used, we find them both advertized in Drummond & Sons' of Stirling, lists of agricultural implements. We copy the following notices from these lists, published in the appendix of Jackson's *Treatise on Agriculture* in 1840: "Smith's reaping machine acts with revolving cutters; propelled by two horses, cut down eight to ten acres per day, price £30. From the simplicity of the construction of the machine, and the excellence of its work, under ordinary favourable circumstances, it is likely to come into general use so soon as better cultivation shall banish the raised ridges, and uneven surface, which still so frequently occur." "Bell's reaping machine—cast iron frame; acts on the clipping principle; cuts down from eight to ten acres per day; propelled by two horses, £15—has been a good deal employed in the Fife and Dundee districts, where it is much appreciated and found very profitable."

Thus though several reaping machines were invented they were not brought into general use. Various causes may be assigned for this. The prejudice of farmers themselves, who have always been slow to adopt and encourage new methods of harvesting may be given as one.* The land too was at the

* To show how slow farmers are to adopt improvements in implements, we copy the following note by W. Chambers, Edinburgh, from Jackson's *Treatise on Agriculture*:

"I lately visited an arable farm of 150 acres in Surrey, on which, as usual in that part of England, there was neither a threshing machine nor fanners, the threshing being done by flail, and the winnowing by throwing the grain from sieves against the wind, which blew through the barn. The farmer never heard there being such an instrument as fanners, would not credit the possibility of threshing with water or horse power. This was within ten miles of London in 1840."