"(6) Between 1810 and 1832, numerous schemes were propounded and patents taken out for ploughing, digging, or trenching the land, by engines working in various ways, but I find nothing of real value until the latter year, when the celebrated John Heathcote, M. P., a lace manufacturer of Tiverton, obtained a patent for certain new and improved methods of draining and cultivating land, and new or improved machinery and apparatus applicable thereto.'

"His engine travelled along the headlands, and when ploughing bogs was constructed with an endless web, forming an endless roadway. His anchor, called by him an 'auxiliary carriage,' also moved along the headland as the work proceeded. Mr. Heathcote described in his specification a means of making his anchor self-propelling. The engine he proposed to fit with two winding barrels, one on each side, so as to work either one or two sets of implements at a time.'

In connection with Mr. Heathcote's scheme, I may mention one fact highly honourable to the foresight and public spirit of the Highland and Agricultural Society of Scotland.

"As long ago as 1837, this society offered a premium of £500 for the first successful application of steam power to the cultivation of the soil. Mr. Hall Maxwell, the zealous and indefatigable secretary writes me :—'At the society's show held at Dumfries the same year, £100 in addition was subscribed to pay the expenses of exhibiting and working what was called 'Heathcoats' Plough"' The trial of this plough was to some extent satisfactory: but the judges did not consider the implement sufficiently perfect to entitle it to the premium. The society, however, continued to offer the prize until the year 1843

"Some 20 years afterwards, the Royal Agricultural Society of England followed the example of the Highland Society, by offering a prize of a similar amount, and it would have done well and saved a great deal of 'heart-burning' if it had also followed the Highland Society in the simple wording of the offer, viz., 'the first successful application of steam power to the cultivation of the soil.'

"(7) Mr. Heathcoat was followed by Alexander Mac Rea, who in 1839 obtained a patent for 'machinery for cultivating land by steam power.' The primary object it would appear, was to adapt his apparatus for use in British Guiana, where the fields are intersected by wide ditches and canals.

"Mac Rea, although his engine and anchor are shown working in boats, described his apparatus as applicable to the unlevel lands by working the engine and anchor along the headlands.

"The implement of this inventor is worthy of notice, for, as the drawings show, it is arranged with the ploughs point to point, as Messrs. Fiskins and Mr. Fowler's, to which it bears a strong resemblance; Mac Rae also anticipated our friend Mr. Williams, of Baydon, by having each plough independent of the other, like coulters of a drill.

"(8) In 1849 Mr. H. Hannam, of Burr near Abingdon, a well-known agriculturist, connection with Messrs. Barrett and Exall, constructed an apparatus for steam ploughing which may be regarded as the first attempt to w ploughs or cultivators by the ordinary portable engine, and also to be the first attempt to plo the land by an engine stationed at one corner outside the field. We have no evidence that wire ropes were ever employed for steam plowing until those supplied to Mr. Hannam Messrs. Barratt and Exall. From Mr. Ex learn that the ropes were 1600 yards in len and from the drawings exhibited it will be that they were coiled and uncoiled by a stationary windlass, having two winding barrels, in same manner as those now in use. The r were also passed round pulleys at the corner the fields and now so well known.

"About 60 acres were ploughed or cultiv by this apparatus at the rate of about 5 per day, when it appears the rope, from defic strength, or probably from bad handling, g way. *Doubtless, had more perseverance* shown, the parties would have been rew with greater success; but I very much que whether any system of rope traction would become a permanent success but for the i duction of ropes made of steel wire, which contributed very greatly to their durability.

"(9) In 1851, at the great exhibition, I Willoughby D'Eresby showed a complete st ploughing apparatus, consisting of two engi with a winding barrel on each—*i. e.*, an e for each headland. These advanced as work proceeded. A number of ploughs on l cock's turnwrest principle were placed in a fi and wound or drawn from engine to engine chain. I believe if a wire rope instead chain had been employed his lordship w have succeeded.

"(10) Following up the course of inven we next come to the scheme of Messrs. Fi of Stockton-on-Tees. A stationary engine employed, a main object of Mr. Fiskin bei dispense with wire ropes, and give off the p of the engine by means of a light, ea hempen cord, worked at a high velocity, passed round pulleys on a self moving ant and thence to winding-drums placed upon implement, the revolution of which imp motion to the ploughs. The anchors were propelling, their onward motion being ca by the revolution of the pulley placed on anchor and round which the rope was pa second, the plough was on the balance prin and was steered in either direction by me locking the wheels. This apparatus was ex ted at the Royal Agricultural meeting in l and created quite a sensation; as well as m a very favourable impression."