PLOUGHING BY STEAM.

We had on Friday an opportunity of witnessing a very successful application of steam power to the ploughing of land—a locomotive plough, invented by Mr. James Usher, brewer, having been set in motion on a large field on the farm of Bankholm, Inverleith. A model of the invention was shown in the Great Exhibition, but this was the first experiment on a scale sufficient to test the merits of the invention.

The steam plough might, at a little distance, be taken for a railway engine without its tender; but it moves in the reverse direction, and the revolving ploughshares are placed immediately behind the funnel. The adaptation of propulsive power to the machine renders it different from most other steam-ploughs that have hitherto been invented—the system of endless chains and stationary engines having been the plan generally adopted heretofore. The machine of Mr. Usher is therefore much more simple and manageable, and more capable of application to irregularly marched fields, while the superficies of ground traversed will be at least as great.

"The invention consists," to borrow the description given by the patentee, "firstly, in mounting a series of ploughs in the same plane around an axis, so that the ploughs shall successively come into action; and secondly, in applying power to give rotary motion to a series of ploughs, or other instruments for tilling the earth, so that the resistance of the earth to the ploughs or instruments, as they enter and travel through the earth, shall cause the machine to be propelled; thus making the plough act in the earth in the same way as paddle-wheels do in the water, by which the vessel is moved along, and the resistance of the earth being greater than the water, the power obtained is proportionally more. * * * * Not only the ploughs, which are set in the same plane around the axis, follow each other into action, but the ploughs of the other sets (which are affixed around the axis in parallel planes) are arranged and come into action, so that two ploughshares will not strike the earth at the same instant."

The locomotive exhibited was of ten-horse power, and although only four ploughs were affixed to it, it is adapted for working six, and might be made capable of working eight or even ten, without increase of power. Of course the amount of power that might be introduced into the locomotive is indefinite, and the series of ploughs might be made to compass any proportionate breadth of land; but perhaps the most manageable scale was that on which the invention was exhibited, with the addition of two more ploughs, for which it was intended but which had not been prepared in time. The depth to which the ploughshares penetrated the soil was from seven to nine inches, something more than that of the horse-plough; while, instead of the regular and orderly furrows we are accustomed to see, the loam was torn up as loosely as garden mould. With a few improvements on the mechanism, the locomotive will be able to turn and move about, so as to turn up every inch of the soil, it being at present defective in various details, which could only be discovered by experiment. The field on which it was tried was level, but the steam-plough could, it is supposed, accomplish gradients of 15 in 100; and, although there are circumstances in which it could not be brought into action, Mr Usher has little doubt that the greater part of the arable land of the country might be cultivated by the agency of steam.

The ground traversed could not be strictly computed, from the experimental nature of yesterday's proceedings; but allowing the steam plough to go at double the rate of a horse plough, which several practical gentlemen present estimated to be its space, and to drive six ploughs at once, and only occupy two skilled men instead of twelve laborers comparatively unskilled, some idea may be formed of the saving which it would effect to agriculturists. The cost of a locomotive plough would be 400*l.* or 500*l.*; but were it brought into general requisition, it would more probably be hired than kept by farmers.

What the effects of the general application of steam to agricultural purposes might be, it would be premature to speculate. That powerful agency has caused a revolution in many handicraft trades, and may be destined to innovate on rural as well as on urban occupations. The feasibility of the invention was admitted by all who saw it, and it was also evident that the principle had reached a very considerable extent of practical development, and that, while several palpable defects could be readily removed, new and most important capabilities might still be added. In one of the experiments, a harrow was attached to the ploughing machine, and it was suggested that were a broadcast sowing machine added, and another harrow perhaps, to bring up the rear, the whole work of spring might be thus accomplished at once.

About forty or fifty gentlemen, many of whom were practical agriculturists, were present, and among others were Mr. Hall Maxwell, the secretary, and several members of the Highland and Agricultural Society, who seemed highly interested and pleased with the invention.—*Edinburgh Courant.*

ECONOMY IN DRAINING.

Agriculturists from other countries who visited the late Great Exhibition, availing themselves of the opportunity of a tour through England, were astonished at the luxuriant crops which were to be found in districts where drainage had been effectively executed, and improved modes of culture adopted; and they failed not, on their return to their native land, to make known the secret of the success of the British farmer, that the foundation of all improvements was drainage. We hope the period is not far distant when there will not be an acre of land in cultivation undrained in the United Kingdom.

The owners of the soil cannot invest their capital in a more secure and ultimately profitable enterprise than the drainage of their estate; but the present period requires—when the price of agricultural produce and rents are considerably reduced,—that in any outlay for the improvements of the land, that it should be done with economy, at the same time efficiently.

We invite attention to the very able pamphlet on drainage, written by Mr. Hewitt Davies, in reply to Lord Wharncliffe's paper in the Royal Agricultural Society's Journal. The subject is well investigated by both writers, and should be perused by those who intend carrying out the system of draining in the most approved mode.

We have occasionally referred to the new and economical invention of draining as practiced