A MANUAL OF PRACTICAL DRAINING

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BY

HENRY STEPHENS, F.R.S.E.

AUTHOR OF "THE BOOK OF THE FARM."

In grounds by art laid dry, the aqueous bane
That marr'd the wholesome herbs is turn'd to use;
And drains, while drawing noxious moisture off,
Serve also to diffuse a due supply.

GRAHAM.

THIRD EDITION.

CORRECTED AND IMPROVED.

WILLIAM BLACKWOOD AND SONS,
EDINBURGH AND LONDON.
MDCCCXLVIII.

ADVERTISEMENT TO THE THIRD EDITION.

Another edition of this little work being wanted, I have endeavoured to make the instructions contained in it in conformity with the experience of draining up to the present moment. So busily and generally has draining been conducted in the last few months, that scarcely a day passes but what gives birth to some new suggestion, or modification of old practice. Profiting by what is going on, I have not hesitated to modify some of the particulars of practice I have hitherto followed; and it is possible that we shall all be obliged to modify still more the views hitherto entertained on many points of thorough-draining, and especially on the depth and distance of drains in soils of various qualities.

The amended Drainage Act, as was expected, includes the payment of trenching and fencing waste ground that has been drained; and another and later Act provides for proper outfalls for drains from any property.

THE AUTHOR.

REDBRAE COTTAGE, EDINBURGH,
March 1848.

PREFACE.

When the portions of the Book of the Farm treating of Draining appeared, it was suggested to me to publish the article in a separate form, because, as my friends alleged, so important a subject as Draining would make a popular book. However good the idea, or flattering the suggestion, my time was too much occupied with the bringing out of my systematic work, to avail myself of it.

Changes, however, have of late been made by the Legislature, which will ere long, as I conceive, necessitate the practice of draining in every part of the kingdom: For, I suppose, even the most ardent promoter of free-trade is not disposed to deny, that the entire abolition of protective duties will place the produce of our own land in a position much more unfavourable than that of the foreigner, by both being brought into direct competition in our own market. Nor, on the other hand, can it be gainsaid by the strictest protectionist of native agriculture, that a very large proportion of the land of this kingdom is still much in want of draining, and that draining is the first and most efficient step towards exciting the natural, and increasing the acquired fertility of the soil. To compete, therefore, with the foreigner, there exists with the agriculturists of this country the most powerful incentive for increasing the permanent fertility of the soil, if that be practicable; and its practicability is known by the agriculturists themselves to be in their own hands, by pursuing a substantial system of draining.

I acknowledge that the attempt to foretell, at the present moment, the ultimate effect of the direct competition of foreign grain on our arable agriculture would be rash; but the mind cannot elude the conviction, that our farmers will henceforward receive a lower price for their grain than they have hitherto received. At the same time, it would be equally rash to assert that the soil of the kingdom is inadequate to raise sufficient food for its inhabitants, while as yet draining has not been efficiently and universally practised.

Hitherto draining, as a promoter of fertility, has not been neglected in this country, for large sums have been expended, and much trouble bestowed upon it. Through a long series of years, and until a recent period, draining was confined to the practice of Elkington's system, which inculcates the penetrating of deep wide

cuts into the seats of springs of water; and its prosecution, with this particular object in view, has been attended with much success. It was, however, at length discovered, that spring-water making its appearance at the surface was not the only, but the smallest, source of injury to the land; the mould operated on by the plough evidently deriving much greater injury from the pestilential influence of rain-water and melted snow, remaining in a state of stagnation upon the retentive subsoil immediately under it, than from spring-water. Various devices have been suggested for getting quit of this stagnant water, but the most rational one consisted of making numerous covered drains under the surface of the cultivated land, into which the rain, on falling, might immediately subside, through the porous mould and fissured subsoil, and find a channel along their bottom, to any receptacle fit to receive it. This method is known by the name of Thorough-Draining, and was first introduced to public notice by Mr Smith, when at Deanston, and has since obtained the approval of all practical farmers, though some of them had quietly drained portions of their farms on that system for several years previous to his announcement of it.

Like most subjects of public utility, however, the best method of applying thorough-draining to particular circumstances has occasioned considerable difference of opinion amongst its most active promoters. What at present causes most controversy, is regarding the depth and position of the drain that will most quickly and effectually convey away surface water. Mr Smith insists that surface water is most quickly and effectually removed by drains placed at short intervals, and most economically so when the drains are not cut too deep. Mr Parkes, Consulting-Engineer of the English Agricultural Society, maintains, on the other hand, that the surface water is most effectually and economically absorbed by deep drains placed at wide intervals. These two points constitute the whole difference in practice respectively advocated by these opponents, though I am aware that much difference of theoretical opinion also exists between them.

Many present at the discussion on draining, at Newcastle, on the occasion of the meeting of the English Agricultural Society in July 1846, might conclude, that the views taken by the opposite parties who conducted the controversy were irreconcilable; but, as I understood the merits of the controversy, the conclusion arrived at by both parties was right, when the state of the subsoil was suited to the particular view of each; but that both were wrong in applying his particular view to every state of the subsoil. Were subsoils all alike, similar depths and distances of drains — whether deep or shallow, wide asunder or near — would, of course, suit them all; but as subsoils are known to differ very much in their quality of permitting water to percolate through them, that is judicious draining which suits itself to the nature of the subsoil, and, by a parity of reasoning, that injudicious which

recommends the same depth and distance of drain in every kind of subsoil. Should examination ascertain that drains of four feet in depth are required to reach the part of the subsoil through which the water percolates most copiously, then, of course, the drains ought to reach that depth before they can either receive all the rain that descends from the surface, or present channels for the conveyance of the water stagnating there. It is no objection to such a common-sense-like proceeding, that this is no other than Elkington's method, and not the improved or thorough system of draining, because, wherever land *cannot* be thoroughly drained but by the assistance of Elkington's method, its *principle* ought to be applied to gain the end in view; and this is as capable of being adapted to parallel and furrow draining as to the ramified form recommended by Elkington, and practised by his followers. It was the great error of Elkington's disciples to apply his ramified form of drainage to every state of wet soil; and it would be to commit a similar error in the present day to apply any system of *fixed* rules to every condition of subsoil. There should, therefore, be no controversy on the practice of draining; since every drainer ought to be right in his own case, and every judicious drainer will reject all dogmatic rules on the subject, and judge for himself in reference to the circumstances in which he is placed.

These are my views of the principles upon which draining should be practised, and I have endeavoured to illustrate and reduce them to practical rules for the use of drainers, with reference to the very various subsoils that exist under the soils of this country. The extent of my observations enables me to say, that too many drains, especially in England, have of late years been executed irrespective of those principles, or of any other, but solely on the desire to expend as little money in their construction as possible,—a resolution erroneously regarded by many farmers as evincing the very spirit of economy. Time will demonstrate whether or not inefficient drains are economical; and though they may answer the temporary purpose of a tenant—whose regard for the soil is apt to be measured by the duration of the tenure by which he occupies it—they will eventually do harm, by becoming ready-formed receptacles for stagnant water, which will require greater cost to remove than the original wetness of the ground. Yet, as long as landlords stand aloof, and view with inward satisfaction the short-sighted though industrial efforts of their tenants to improve their land, and express no desire to assist them, it is not surprising that tenants should hesitate to spend larger sums than they conceive they are likely to be repaid from the land during the course of a lease: and the ultimate injurious effects which the parsimony of the tenants inflicts upon the land seem but a just punishment on landlords for indifference to the improvement of their own property. To remove a temptation like this from tenants, whose means are generally limited, landlords should