

by heat, but not caused by it at all times, as an apparently cool wind will very often cause more evaporation than takes place in many instances under a higher temperature of the atmosphere. When the weather is warm and genial, and as I have already said, that the temperature of the soil when drained is higher than it was previously, it must follow that the power of evaporation is also greater, in proportion to the difference in the temperature caused by drainage, by which then you will perceive that evaporation is enabled to perform the work of preparing the soil for the seed, making it dry and mellow with greater rapidity on drained, than on undrained soils, and both working together have a very beautiful effect upon the soil.

Having directed your attention to a few of the systems of drainage as practised to so great an extent in Britain, and also in the United States to a considerable degree—together with a sort of digest of what has been done in this section of our country, and having attempted to show the effects of rain, drainage, and evaporation upon the soil, I will now proceed to show you that although draining has been carried on to such an extent in Britain, it is not because the land requires it more there, owing to a greater amount of moisture or rain than we have to contend against in this country, but, on the contrary, it has been clearly proved by scientific observations that there is a greater quantity of rain during the year in America than in Britain. It is computed that the average annual fall of rain in England is as follows, viz. In the eastern portion it is estimated at 20 inches, midland, 22 inches, and western 35 inches, whereas in this country and in the northern and Eastern States the average annual fall amounts to about 40 inches. The rain also falls more moderately in England than it does in this country. They seldom have such deluges of rain as we have here, flooding the land to the depth of several inches, and, on undrained lands, frequently lying in small lakes for days afterwards. By this you will perceive that this country, compared with England in regard to the amount of rain, should in reality require more drainage to keep the soil in a proper state than is required in England; because, as already stated, the rain falls more regularly there and never in such quantities in a single day, and also because, there, the soil is open the most of the winter, so that it can be worked almost every day

with the plow. While in this country for several months our fields are completely locked up in frost, in consequence of which our work in spring has to be done in a few days—often very superficially on account of the state of the land. But I would remark, though speaking in general terms of this country requiring more drainage than England, still I do not wish you to understand me to say that all lands even in this country require drainage. On the contrary, I am fully convinced that there is a great deal of land in this country as well as in other countries, which does not require artificial drainage; it having a natural porous subsoil through which the superfluous water may find a free passage. And I have sought to obtain a tolerably correct idea of the principles of drainage, so that they may be able to discern between soils which do not require drainage, and those that do. I wish before leaving this part of our subject to impress upon your minds this important consideration, that we should understand the land we cultivate, which has its own natural drainage in itself. For you must depend upon it, that so long as this is not so long will we be troubled with winter-blast, mildew, blight, and all the other evils which late crops are exposed to.

But the main point to be considered is it pay to drain land in this country. We will consider under certain circumstances it will require a moderate outlay, but we must bear in mind that whatever outlay we make it ought to be considered as a permanent improvement, similar to the putting up of buildings on a farm, which pay for themselves ultimately, by saving grain, and waste in stacking, although in one or two years. Still, in my opinion, a moderate outlay on draining will pay for itself as well as buildings for saving grain, and will return good interest for the money invested, besides enhancing the value of the land permanently, to more than the amount expended. By way of illustration let us suppose this idea,—say for instance that if you have a piece of land, say 10 acres worth \$80 per acre, and that it pays you now in the way you work it a yearly profit of 6 per cent on this value. Now suppose it costs one third more to drain it, the one-third of \$80 is \$26 66 $\frac{2}{3}$, which is sufficient to thorough drain it, with drains 40 feet apart throughout the field, in many instances would not be necessary. Drains at 66 feet apart, or four