

determine the percentage of water. As a final test, the different samples are submitted to the inspection of an expert largely engaged in a first-class butter trade. I am well aware that this method would entail the expenditure of extra time and labour, but if strictly carried out it would be a step in the direction of progress, by introducing the teaching of correct principles to a rural industry which is still in a languid condition, and is likely to continue so unless a more expansive system is adopted.

GILBERT MURRAY.

## The Farm.

### PLOUGHING.

Much may be, and much has been, written about ploughing. It would be easy to occupy column after column with the history of ploughs and their modifications.

To the farmer, however, ploughing is a practical fact, an inevitable expense, and a useful cultivation. On a farm with 400 acres of tillage land there will be at least 500 acres of ploughing to be done every year, at a cost variously computed of from 8s. to 12s. On stiff clay land the cost of ploughing touches £1 per acre, (land on light lands in loose condition the moving of the soil by the plough probably only cost 6s. There can be little doubt that the opinion of even practical men upon the cost of ploughing are often based upon insufficient grounds, and the tendency among valuers is to over-estimate the cost.

When a man or lad ploughs an acre of land with a furrow 9 in. wide, he walks exactly eleven miles, without reckoning turnings or the distance from the stable to the field and back again. It is one of the economies of large fields that the time lost in turnings at the ends is reduced to the least amount. If a man ploughs an acre 352 yards long with a 9 in. furrow he goes twenty-seven and a half times round, and turns on the headland fifty-five times. If we allow one minute for turning, the time thus lost is equal to fifty-five minutes. This would be a field of over average length, being sixteen chains long. If a field is eight chains, or 176 yards long, the number of turnings is exactly doubled, and the amount of time absorbed in turning at the ends amounts to 2 hours and 50 minutes. If a field is 5½ chains long (117½ yards), which is not an unusually small length, then the ploughman will require to turn 165 times, in order to do one acre with a 9-in. furrow, and still allowing one minute to be consumed in turning, he will occupy 2½ hours in this profitless description of work.

### PLOUGH PACE.

If we require an answer to the question "How long will a man and horses require to plough an acre of land?" we say much must depend upon the average pace at which the plough travels, and, as shown above, much will depend upon the length of the furrow, and the consequent number of turnings. Now, plough pace is not an exciting speed. As fair walking is reckoned at four miles an hour, so plough pace may be, and has been, taken at two miles per hour, or even

In the Lias and Oxford-clay formations, fewer than 4 horses in a plough are no use. Ed.

as low as one and a half miles an hour. Applying these figures to the eleven miles walked in ploughing an exact acre, we see that to plough an acre at the rate of two miles an hour would need five and a half hours, and to plough an acre at the rate of one and a-half miles an hour would need seven and one-third hours. To these times must be added the time required to walk to and from the field, and the time wasted on the headlands in repeated turnings.

### CASE 1.

We shall first take the case of a ridge sixteen chains, or 352 yards, long, and a distance from home of half a mile. The time required to plough this acre may be computed reasonably as follows:

	hrs.	min.
For walking to and from the field, 1 mile.....	0	30
For actual ploughing at 1½ mile per hour.....	7	20
Time lost on headland.....	0	55
	8	45

Now, supposing the man starts at 7 a. m. and returns home at 4 p. m., and further supposing that he has rested half an hour in the middle of the day, he has been at work 8 hours and 30 minutes, and would therefore only be able to do his acre by keeping within the allotted times given above.

### CASE 2.

If, however, the land is light and plough pace can be kept up to 2 miles per hour, the case stands as follows:—

	hrs.	min.
For walking to and from the field, 1 mile.....	0	30
For actual ploughing at 2 miles per hour.....	5	30
Time lost on headland.....	0	55
	6	55

A few test cases might readily be taken by a master in order to ascertain what is the habitual pace of his teams when at work, and we are inclined to think it will be found nearer 2 miles an hour than 1½.

### CASE 3.

Let us now apply these figures to the case of short ridges of 117½ yards in length. In the first case we shall take stiffish land, on which the horses move along at the very dignified pace of 1½ miles an hour. Assuming the same distance from home, we have the following result:—

	hrs.	min.
For walking to and from the field.....	0	30
For actual ploughing at 1½ miles per hour.....	7	20
Time lost on headland.....	2	45
	10	35

In this case it would need 7 hours 56 minutes to plough three-quarters of an acre, and this would probably be about what would be accomplished.

### CASE 4.

Lastly, we take the case of easier working land, in which the horses move at the rate of 2 miles per hour, but when the work is retarded by short ridges and many turnings:—

	hrs.	min.
For walking to and from the field, 1 mile.....	0	30
For actual ploughing at 2 miles per hour.....	5	30
Time lost on headland.....	2	45
	8	45

It will be seen by reference to case 1 that strong land with long ridges takes no more time to plough than light land with short ridges. The two agree to a minute.

### PLOUGHING WITH A WIDER FURROW SHIN.

The above calculations are made upon the assumption of a 4 in. furrow shin. We are, however, disposed to think that the ordinary furrow slice is 10 inches, in which case the distance to be walked in ploughing an acre is reduced from eleven miles to 9.9, or we may say ten miles.

With a 10-in. furrow the ploughman, therefore, saves one mile of walking in ploughing his acre, which may be computed as worth from half an hour to three quarters, according to the estimate of plough pace. If, then, we assume that a 10-in. furrow slice is cut, we are entitled to make a deduction from the calculated time. (1)

### CONCLUSION.

The conclusion may, therefore, be fairly drawn that with a 10-in. furrow, on light land, and in large fields, where the ridges are 352 yards long, that it ought not to need more than 6 hours and 25 minutes to plough an acre, supposing that the ordinary pace is two miles an hour. That in short fields, where a greater amount of time is lost in turning, an acre ought not to require more time than 8 hours 15 minutes.

Now we particularly wish to call attention of readers to the expression "plough pace." A great deal depends upon this factor, and in assuming it at one and a-half miles per hour for heavy land, and two miles per hour for light land, we are probably doing an injustice to that spirited animal, the farm horse, and that spirited rustic who accompanies him in his daily tasks.

It is from data such as we have given above that we can alone arrive at a sound conclusion as to the actual time which ought to be consumed in ploughing land of various qualities. It is a matter of time and of space.

JOHN WRIGHTSON.

### PLOUGH PACE.

Yesterday I had an opportunity of quietly watching the teams, and I found that the ploughs went five "bouts" in exactly 45 minutes in a furrow 312 yards long. That is, they travelled 2,496 yards in 45 minutes, or at the rate of 3,328 yards per hour = 1.8909 miles per hour. I also took observations of horses dragging (four-horse harrowing), and I found that they travelled at the rate of 1.61 miles an hour.

The circulation made upon the spot may be given as follows:—Six horses, drawing three wooden drags, went several bouts at an average speed of one bout of 440 yards in 9 min. This was 1 mile in 36 min. The work done measured exactly 20 ft. in width, and

(1) In 1872, at Compton, Col. Pomeroy's man told us he usually ploughed THREE acres a day!—Ed.

the area performed in one hour would be exactly 4 acres. These three drags were, therefore, working at the rate of 82 acres in a day of eight hours, or close upon 11 acres each per ordinary day. (1)

### COST PER ACRE.

If six horses cost 2s. a day each, and the boys with them are valued as receiving 1s. 8d. per day, the cost would be 12s. a day, or under 6½d. per acre and to this must be added the wear-and-tear of the drags, which may be assumed at 3s. The total cost of dragging would, therefore, appear to be about 7½d. per acre. We would ask how this is to be reconciled with the reckless figures almost always attached to costs of tillages, based upon the ideas of professional valuers? Referring once more to the statistic above given of the actual speed of horses in ploughing 1.8 miles per hour represents 14.4 miles in eight hours, whereas in order to plough an acre with a 9 in. furrow exactly eleven miles must be walked. The requisite distance would, at the rate ascertained, be done in just over six hours on land after sheep folding. There ought, therefore, to be no difficulty on any medium land in ploughing one acre a day, and yet this is generally looked upon as an amount which can scarcely be maintained as an average. We are disposed to think that, leaving out of consideration really stiff soils, such an average ought to be kept up. I have thought it worth putting the above observations on record because they were made without the knowledge of the teamsmen, who were "ganning their own gait." If other would and record the actual speed of their teams, and measure the length and the breadth of the work, we should obtain clearer ideas as to what is done and what ought to be expected.

(Ag. Gazette.)

### PREPARATION OF SEED-BEDS.

At the season of spring there is nothing of greater importance to the arable farmer than the preparation of seed beds, for much of the success of the year depends upon the condition the land is in at the time the seed is sown. Autumn-sown crops are not so much influenced by the state of the land when they are put in, because the hardness which enables them to live through the rigours of a severe winter also befits them to overcome other difficulties connected with the early stages of their existence, and inequalities of growth during autumn are rectified during the comparatively dormant period of winter.

The two essential points in obtaining a till, and which always will secure it—providing always the land is properly drained—are that the tiller knows when to work the land, and when to leave it alone, and that, knowing these, he loses no opportunity that presents itself, but turns to best account the varying conditions of climate. In the first place, it is useless to stir wet and heavy land until it is sufficiently dry, for if stirred too early it is rendered more unworkable, and the labour bestowed, instead of aiding, hinders progress. Not a few mistakes are made every season in this way, and it is to be regretted that there should be such a poor reward for the energy displayed, as no one who gets behind with his work can hope to come out

(1) We talk here of 2½ and even 3 acres a day ploughed by a pair of horses!—Ed.