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T H E
R U R A L E C O N O M Y
O F
N O R F O L K:
C O M P R I S I N G T H E
Management of Landed Estates,
A N D T H E
P R E S E N T P R A C T I C E o f H U S B A N D R Y
I N T H A T C O U N T Y.

By Mr. M A R S H A L L,
(Author of MINUTES OF AGRICULTURE, &c.)
RESIDENT upwards of Two Years in NORFOLK.

I N T W O V O L U M E S,
V O L. II.

L O N D O N:
Printed for T. CADELL, in the STRAND.
M,DCC,LXXXVII.

THE NATIONAL ANTHROPOLOGICAL ARCHIVES

1912

REPORT OF THE

COMMISSIONER OF THE

GEORGETOWN COLLEGE

AND THE

NATIONAL MUSEUM OF NATURAL HISTORY

IN THAT COUNTY

BY
W. H. R. ...
(Author of ...)

IN TWO VOLUMES

VOLUME II

LONDON

W. H. R. ...
PUBLISHED

A D D R E S S

TO THE

R E A D E R.

IN registering the practice of this District, I pursued a two-fold method. Such established rules of management as are generally observed in common practice, I committed to a **SYSTEMATIZED REGISTER**, as they occurred to my observation. But such particular operations, and peculiarities of management, as required an accurate detail of circumstances;—also such complex observations, as included a plurality of subjects;—also such instances of practice and opinion, as I found peculiar to individuals;—I reduced to **MINUTES**, in series, with those on my own practice.

A 2

In

In preparing these materials for publication I was desirous, on the principle of simplicity, to have united the two registers: that is, to have incorporated the MINUTES with the systematized matter. But this I found entirely incompatible with the simplicity I was seeking. Many of the individual minutes pertaining to a variety of distinct subjects, would not assimilate with any *one* of them; while others were, in strictness, foreign to the system of practice prevalent in the District; being upon incidents in my own practice, and upon observations and reflections on subjects not especially connected with the rural affairs of Norfolk, but equally relative to the rural economy of the Island at large.

Thus, seeing the necessity of keeping the two registers distinct, in some degree, I thought it right to let them remain (with a few exceptions) in the manner in which they were written: but, in order to connect them as intimately as the nature
of

of them would admit of, I digested the subjects of the MINUTES, and suspended them to their corresponding subjects in the SYSTEM; through which means the two registers may be read together, or separately, at the option of the reader.

I was induced to adopt this method, with less hesitation, as I am still more and more convinced that PRACTICAL KNOWLEDGE is never conveyed more forcibly than in MINUTES, made while the MINUTIÆ of practice are fresh in the memory, and the attendant CIRCUMSTANCES are still present to the imagination. Nor am I singular in this opinion. A masterly writer conveys the same sentiment, in more elegant language. "It must," says he, "be acknowledged, that the methods of disquisition and teaching may be sometimes different, and on very good reason undoubtedly; but, for my part, I am convinced that the method of teaching which approaches most nearly to the method of investigation, is incomparably

rably the best; since, not content with serving up a few barren and lifeless truths, it leads to the stock on which they grew; it tends to set the reader himself in the track of invention, and to direct him into those paths in which the author has made his own discovery, if he should be so happy as to have made any that are valuable."

I will place this subject in a light comparative with two of the learned professions. MINUTES, in rural economy, are as CASES in physic and surgery, and as REPORTS in law. They are all, and equally, if equally authentic, PRACTICE IN ITS BEST FORM. For an agricultor cannot register an incident,—a surgeon, a case,—nor a lawyer, the proceedings and decision of a court, with any degree of accuracy and perspicuousness, until he has ascertained, and set before him, the facts and attendant circumstances respecting it;—and has revolved in his mind the cause, the operation, and the effect.

In

In doing this, he not only finds it necessary to ascertain minutial facts and circumstances, which, otherwise, he would have overlooked; but is led on, by reflection, to inferences which, otherwise, would not have occurred to him: and, if he register fully and faithfully, he knows no more of the given subject, when he has finished his register, than the person who may, afterwards, have read it. Consequently, he not only thereby renders his practice more valuable to himself; but, by reading his report, his minute, or his case, the student gains full possession of the practice of a practitioner.—Hence, principally, a barrister is enabled to step into court, and a physician into a sick room, without the assistance of self-practice.

I will place these subjects in another point of view: The attorney, the apothecary, and the common farmer, are enabled to carry on their respective professions, or callings, without those scientific helps

The former depend upon the practice of their masters, and their own practice, during their clerkship, or apprenticeship; as the farmer does upon that of his father, and the country he happens to be bred in. But why do we, in difficulties, fly from the apothecary to the physician, and from the attorney to the counsellor? Because they have studied their professions scientifically, have obtained a general knowledge, and taken comprehensive views, of their respective subjects;—as well as of the sciences and subjects which are allied to them; and, added to these scientific aids, have made themselves masters of the practice, and the opinions, of the able practitioners who have gone before them; as well as of COTEMPORARY PRACTITIONERS.

With respect to the following MINUTES, it only remains necessary to say, that they were written in an active scene, and that more attention was paid to circumstances than to language. Those on husbandry were written, as I conceive all minutes on
the

the subject ought to be written, in the FAMILIAR LANGUAGE OF FARMING; and, many of them, in the provincial phraseology of the District they were written in. I confess, however, that, in revising them for publication, I thought it prudent to do away some of the FAMILIARISMS of the original Minutes. If, in the present form, they furnish such PRACTICAL DATA and NATURAL FACTS as may, in the end, be serviceable to the main design, and, in the instant, be acceptable to PRACTITIONERS, and useful to the STUDENT, the intention of publishing them will be fully obtained.

London, Feb. 1, 1787.

C O N T E N T S
OF THE
S E C O N D V O L U M E.
M I N U T E S.

1780.

No.

1. **T**HE measurement of ———— *a sheepfold.*
2. **T**he Norfolk method of ———— *underdraining.*
3. Steeping the seed, and ———— *resowing turneps.*
4. The Norfolk method of ———— *exchanging lands.*

1781.

5. On tenants ———— *pruning hedgerow timber.*
6. An instance of ———— *burning ant-hills.*
7. On the practice and profit of ———— *mowing pastures.*
8. Incidents on ———— *mixing cattle and sheep.*
9. On planting *ivy* against ———— *sea-stone fence-walls.*
10. Effects of ———— *shovelings of a sheepfold on grassland.*

AUGUST.

12. Observations on the ———— *turnep-caterpillar.*
13. On the evil effects of the ———— *berbery plant.*

C O N T E N T S.

14. An instance of _____ *mowing wheat.*
15. The method of laying _____ *clay hay-chamber-floors.*
16. Experiments and observations on _____ *weld.*
17. _____ on _____ *putting ewes to rams.*
18. _____ on _____ *manures for wheat.*
19. _____ on the mode of _____ *sowing wheat.*
20. Obs. on the *Anbury* and other — *enemies of turneps.*
21. Instance of sheep-fold checking the — *turnep-fly.*

S E P T E M B E R.

22. Observations on the cause of the _____ *Anbury.*
23. The rise and practice of _____ *dibbling wheat,*

O C T O B E R.

24. Instance of _____ *sowing clover in autumn.*
25. Observations on the _____ *peaks of gables.*
26. Further observations on _____ *dibbling wheat.*
27. Observations on the _____ *bullock-fair of St. Faith's.*
28. Further observations on _____ *dibbling wheat.*
29. Sundry experiments with _____ *lime.*

N O V E M B E R.

30. Reflections on _____ *furze-food.*
31. — on the — *unproductiveness of a fair-stead.*
32. The Norfolk method of — *thatching with reed.*
33. A secure way of — _____ *laying pantiles.*
34. Observations on the — *time of cutting hedge-wood.*
35. On the utility and the height of — *check-beams.*
36. Observations and incidents on — *tapping oaks.*
37. Instance of success in — *transplanting oaks.*
38. Observations on the proper soil, &c. for — *the ash.*
39. Description of _____ *Holt fair.*
40. On the profitableness of the — *Iste-of-Sky-Scotts.*

DE-

C O N T E N T S.

D E C E M B E R.

- 41. On laying up wheat-lands among ——— *pheasants.*
- 42. A regulation for the ——— *preservation of hedges.*
- 43. Incident on ——— *sowing wheat between-furrows.*
- 44. The Norfolk method of ——— *opening drains.*
- 45. Observations on making ——— *ditches on hill-sides.*

1782.

- 46. Mr. Bayfield's observation on ——— *rearing cattle.*
- 47. Reflections on the time of ——— *receiving rents.*
- 48. Observations on ——— *laying pantiles.*
- 49. On the Norfolk farmers partiality for — *arable land.*
- 50. The method of ——— *"gelding" ant-hills.*
- 51. General observations on ——— *Norfolk meadows.*
- 52. A singular instance of ——— *fatting swine.*
- 53. Instance of practice in ——— *rearing calves.*
- 54. An account of the ——— *peat-grounds of the fens.*
- 55. Obs. on ——— *marling in South-Walsbam hundred.*
- 56. Observations on ——— *bullocks at turneps in the yard.*
- 57. ——— *in the field, &c.*
- Observations on ——— *hoeing turneps.*
- ——— a singular — *light land soil-process.*
- 58. Reflections on the present poverty of — *farmers.*

F E B R U A R Y.

- 59. Instance of an ——— *oak thriving in sand.*
- ——— the absorbency of the — *Norfolk soil.*
- 60. Observations on ——— *buttresses.*
- 61. Instance of ——— *preserving turneps.*
- 62. ——— a flourishing though — *disbarked ash.*
- 63. Observations on ——— *ivied ditches.*

C O N T E N T S.

64. Observations on the annual ——— *repair of roofs.*
 65. Instance of shameful management of ——— *meadows.*
 66. Observations on ——— *rubbing-posts.*
 67. Mr. Bayfield's method of ——— *sowing wheat.*
 68. Observations on the ——— *price of turneps.*
 69. General observations on ——— *bullocks at turneps.*
 —. Practice of individuals in ——— *bullocks at turneps.*
 70. Practice of individuals in ——— *rearing calves.*
 71. Particular ——— *seed-process for turneps.*
 72. Norfolk treatment of ——— *choaked bullocks.*
 —. Comparifon between ——— *homebreds and Scots, &c.*
 73. Gen. obs. on — *farm-yard management of straw.*
 74. Instances of the — *winter-management of store-cattle.*
 75. Observations on different ——— *breeds of sheep.*
 76. Instance of inconveniency of — *long-wooled sheep.*
 77. Observations on the Norfolk ——— *ditch-mould.*
 78. ——— on the effect of severe weather on — *lambs.*
 79. Instance of convert. arable land to — *rabbit-warren.*
 80. Description of the business of a — *Norf. corn-market.*
 81. On the choice of the species of tree for — *planting.*

M A R C H.

82. A remarkable effect in ——— *crossing sheep.*
 83. On *turneps* as a spring feed for ——— *cows.*
 84. Observations on ——— *bullocks breaking turneps.*
 85. ——— on thinning ——— *hedge-row timbers.*
 86. Instance of the prolificness in ——— *Norfolk sheep.*
 87. General observations on ——— *renewing hedges.*
 88. ——— *furze-hedges.*
 89. On the Norfolk method of ——— *cutting reed.*
 90. Gen. obs. on hedge-row ——— *timbers and pollards.*

C O N T E N T S.

91. Instance of damage to roofs by a ——— *high wind.*
 92. Observations on the ——— *residence of workmen.*
 93. The effect of severe weather on — *bullocks at turneps.*
 94. Observations on ——— ——— *Aylesham fair.*
 95. Incident and observations on — *weeding plantations.*

A P R I L.

96. On Mr. Horsley's management of his ——— *meadows.*
 97. Observations on two lots of ——— *bullocks at turneps.*
 98. Instance of small expence of ——— *farming in Norfolk.*
 99. Instance of ——— ——— *cutting ridgils.*
 100. On the alertness of the Norfolk farm — *workmen.*

M A Y.

101. Observations on Norwich ——— *clover-seed market.*
 102. Instance of bullocks sold at ——— *Smithfield.*
 ——— Calculation of profit of ——— *bullocks at turneps.*
 103. Instance of the bad construction of — *Norf. ditches.*
 104. On furze-skreens and method of — *sowing furze-seed.*
 105. Observations on ——— ——— *Walsbam fair.*
 106. Observations in the ——— ——— *Fleg hundreds.*
 107. Observations on ——— ——— *Worstead fair.*
 108. Experience in ——— ——— *cheese-making.*
 109. Experience in ——— ——— *making butter.*
 110. Observations on two lots of — *bullocks at turneps.*
 ——— Observations on ——— ——— *buying bullocks.*
 111. Obs. on selling bullocks and on — *Smithfield-market.*
 112. Obs. on the ——— *Eastern coast and Ingham fair.*

J U N E.

113. Obs. on two lots of bullocks sent to — *Smithfield.*
 ——— General observations on ——— *buying bullocks.*
 ——— Observations on ——— ——— *bullocks at grass.*

114. In-

C O N T E N T S.

114. Instance of improper—*management of a wet soil.*
 115. Obs. on the height of — *farm-yard fence-walls.*
 116. Obs. on carrying up — *sea-stone walls.*
 117. — on the pay-day of a — *Smithfield drover.*
 — on the uncertainty of — *Smithfield-market.*
 118. — the *Blowfield hundred* and *Yarmouth-marshes.*
 119. — the sale and profit of — *homebred bullocks.*
 120. Instance of burning the surface of a — *dunghill.*
 121. — of wet weather injuring — *scalds.*

AUGUST.

122. Observations on the — *turnep-caterpillar.*
 123. — *Cawston sheep-show.*
 124. Further observations on the — *turnep Tenthredo.*

SEPTEMBER.

125. Instance of a — *backward season.*
 — Register of the — *advancement of spring.*
 126. Incident of a depopulated hive of — *bees.*
 127. Experiment on the time of — *manuring grassland.*
 128. Incident relative to another — *disbarked ash.*
 129. Further observations on the — *turnep Tenthredo.*
 130. Reflections on the — *Midsummer shoot.*
 131. Description of a cheap — *hog-cistern.*
 132. Final observations on the — *turnep Tenthredo.*

OCTOBER.

133. Experiment on wheat with a — *berbery plant.*
 134. Observations of the — *bullock-fair of St. Faith.*
 135. Description of a — *furze-faggot fence.*
 136. The expence of — *marling by water-carriage.*
 137. Particulars relative to Felbrig — *inclosure.*

PROVINCIALISMS — *page 373*

MINUTES.

M I N U T E S
I N
N O R F O L K.

1.

1780. SEPTEMBER 22d. **T**HIS morning, measured a sheepfold, set out for 600 sheep, consisting of ewes, wedders, and grown lambs. MANURE.

It measures eight by five-and-a-half rods, or forty-four square statute rods; which is somewhat more than seven rods to a hundred, or two yards to a sheep. SHEEP.

2.

OCTOBER 27th. A few weeks ago a tenant asked for some top-wood to under-drain part of a close of arable land; which part being cold and springy, scarcely ever produced a crop; and, this morning, I have been to see the process of *under-draining* in this country. DRAINING.

Having from several years observation marked the springy parts, he began by circumscribing

Vol. II, B ing

2.
DRAINING.

ing them with a drain, made as hereafter described, and then drew others within it in such directions as he knew from observation (not methodically) would convey the superfluous moisture from the wet parts to a main drain and outlet.

The drains were formed by two men, each of them having a tapering spade, and a hooked scoop. The first man took out a spit, with a square-pointed spade ten inches long, seven inches wide at the tread, and five inches at the point; and, to make a smooth footing for the next man to stand upon, drew out the crumbs with a five-inch scoop.

The other man sunk it about eight inches deeper with a round-pointed spade, eight inches long, five inches wide at the tread, and three inches near the point; clearing out the bottom with a narrow-mouthed scoop; namely, two inches and a half to three inches wide: the drain, when finished, being a foot to fourteen inches wide at the top; from eighteen to twenty inches deep; and about three inches wide at the bottom.

These drains were filled with oak and alder boughs in this manner:—

The spray being stript off, the woody parts (from an inch and a half to three inches diameter)

meter) were laid in the bottom of the drain. If crooked, they had a chop given them in the elbow, and then pressed down to the bottom with the foot. If large, one, if small, two or three of these sticks were laid at the bottom; upon these the spray, with the leaves on; and upon this a covering of heath. The whole, when trodden down, appeared to fill the drain within a few inches of the top.

The mould was then laid on and ridged up over the drain.

A roller passed along and finished the operation.

The land was immediately plowed for wheat.

The quantity of land drained is about three acres:

The expence about five pounds, or one pound thirteen shillings and four pence an acre, viz.

Opening and filling in 184 rods at	
3d. - - -	£. 2 6 0
Three loads of boughs (given him by his landlord) suppose - — —	1 10 0
Two loads of heath 14s. carriage	10s. 1 4 0
	<hr/>
	£. 5 0 0

2.

DRAINING.

2.
DRAINING.

He has repeatedly experienced this method of draining, and has found it answer his expectations. He is a cautious judicious husbandman, and would not lay out 3*l.* 10*s.* without a moral certainty of gain.

3.

TURNEPS.

NOVEMBER 8. An experienced farmer in this neighbourhood says he has frequently found that steeping old turnep-feed in water, and letting it lie a few hours in the sun before sowing, has brought it up much sooner than sowing it dry.

He adds, that this year, having neglected to steep it, he had turnep-feed lay three weeks in the ground before it came up. He was advised to plow in the few straggling plants which appeared soon after sowing, under an idea that the fly had eaten off the remainder: but he judged from experience that the principal part of the seed was still in the ground; he accordingly waited until rain fell, and has now, I see, a very fine crop of turneps.

This is a valuable incident; for it is highly probable, that in the beginning of the season, when old seed is obliged to be sown, many crops of turneps have been prevented by plowing the ground prematurely.

No-

4.

4.

NOVEMBER II. *A.* and *B.* having several small pieces of land lying intermixed with each other's estates, agreed upon an exchange by arbitration.

EXCHANGE
OF LANDS.

The particular lands to be exchanged, and the general outline of the agreement having been previously determined upon; and each party having made choice of a referee; articles of agreement for exchange were signed.

The matters left to reference were these :

1st. The rental value of the respective lands in exchange.

2d. To determine which of the timber-trees growing on the premises should be taken down by the then present owners (and removed off the premises before July next ensuing) and which should be left standing.

3d. The value of the timber, stands, pollards, and stub-wood, which the arbitrators should judge proper to be left standing on the premises.

4th. A principal part of *B.*'s land lying at a distance from any of *A.*'s farms, except one which is let on a lease that has six years to run, during which time it remains at the option of the tenant whether or not he will

B 3

rent

4.
EXCHANGE
OF LANDS.

rent these lands ; it was agreed that each party shall, if required, hold his own land (or find a proper tenant) during the said term of six years, at such rent, and under such covenants, as the arbitrators should fix on.

On Monday the 6th instant, the arbitrators met ; and having *previously* named an umpire, or third person, in case they should disagree in their award, entered upon the business ; which was thus conducted.

Having first taken a cursory view of the several pieces to be exchanged ; and having settled between themselves the mode and rate of valuing the wood ; they took the whole before them in this manner :

The arbitrators, both of them men of superior abilities in the business they had undertaken, went first ; pointing out which of the trees should stand, and which be taken down : the latter were marked by chopping off a piece of the bark with an adze. The pollards and stub-wood deemed fit to stand were valued and minuted by the arbitrators themselves ; and the timber-trees measured by two carpenters (one chosen by each party), an account being minuted by an assistant ; by whom likewise the number of stands were taken.

The

The arbitrators, as they passed along, cast their eyes upon the land, and separately put their private valuations upon it.

4.
EXCHANGE
OF LANDS.

The lands having been previously surveyed by two surveyors (one for each party) and the *rate* of valuation of the timber and other woods to be left standing on the premises having been previously fixed upon by the referees, —it now remained to ascertain the value of the several parcels of land; for which purpose a special meeting was appointed and held, yesterday.

To simplify this important part of the business, and to render it as little liable to unnecessary cavil as possible, it was agreed that the difference of rental value, whatever it might happen to be, should be calculated at twenty-five years purchase.

The rental value of the respective pieces therefore now remained the almost only thing in suspense. But in this they had differed widely in their valuations: in some pieces so much as four shillings an acre.

Argument having been tried without effect to reconcile the differences, it was proposed by one of the referees to leave the matter to the umpire.

4.
EXCHANGE
OF LANDS.

Finding things in this state, I ventured to propose a mode of settlement which appeared to me not only brief but equitable. This was, to lay aside intirely the particularized estimates; and, after setting a part which was tythe-free against a part of an inferiour quality, to exchange acre for acre.—It was agreed to by all parties.

There being a balance in the quantity of land under exchange of about four acres and a half, the business was now to fix a fair rental value upon this surplus. After some conversation it was fixed at fifteen shillings an acre.

RENT.

The rent of the land for the next six years was also fixed at the same rate; and the principal covenants entered into were, that the several pieces should be left, as to crops, &c. in the same state in which they now are.

Lastly, the value of the wood to be left upon the premises being ascertained by calculation, the business was ended.

The referees had put down in their estimates the *rent of the land* at twelve to fifteen shillings an acre*.

* The quality of the lands in exchange are, considered collectively, somewhat above the par of lands in this district.

The *oak timber* they valued at eighteen pence, and the *ash timber* at one shilling a foot, measuring all above six inches timber-girt*.

5.
TIMBER.

The *stands*, one with another, at a shilling a piece (less than six inches a stand, more than six a timber tree).

The *pollards* principally from one to three shillings a-piece—some few at four shillings.

FIREWOOD.

The *stub-wood* in proportion to the pollards.

5.

1781. MAY 8. It is imprudent to trust, in any degree, to tenants, in the pruning of timber-trees.

HEDGEROW
TIMBER.

This season I took unusual pains to instruct a young man, whose farm is unmercifully loaded with wood, in what manner he should *set up* some trees which were particularly injurious to his crops (namely, to take off the small boughs close to the stem, and to leave live growing twigs upon the large ones, to draw the sap, and thereby keep the stumps alive); nevertheless the havock committed on his farm is shameful.

* The timber in general coarse.

It

5.

HEDGEROW
TIMBER.

It is true, he blames his men; but this is no excuse: he promised to attend minutely to the business himself. I pointed out the boughs which were proper to be taken off: but for one I pointed out, he has taken off three.

Nor is he the only one who has made the same wilful mistake; and it is a want of common prudence to leave to a tenant a business of so much importance to an estate as the pruning of timber-trees; for he has a double interest in abusing his trust:---he disencumbers his farm, and fills his wood-yard.

In future, when I see it necessary that timber-trees should be lightened of their low-hanging boughs, whether for the preservation of the hedge, or the relief of the crops, I will send a wood-man to do it in a proper manner; and charge the faggots at a fair price to the farmer*.

6.

BURNING
ANT-HILLS.

MAY 10. Some time ago, gave a tenant leave to cut and burn ant-hills off a dole belonging to his farm, upon a common.

* This rule I afterwards observed; and found it not only beneficial to the estate, but agreeable to the tenant; for under this regulation he found more of this necessary work take place upon his farm, than he had theretofore been able to get done.

His

His motive is the improvement of his farm by the ashes ; and his pretext the improvement of the common : both of which good purposes will probably be obtained. He is to level the ground, and rake in grafs-seeds.

His process is to cut them up with a heart-shaped sharp spade or shovel, in irregular lumps of ten to fifteen inches diameter, and two to five or six inches thick. These are turned grafs-downward, until the mould-side be thoroughly dry, and then set up grafs-outward until they are dry enough to burn.

The fire is kindled with brush-wood, and kept smothering, by laying the fods or lumps on gradually as the fire breaks out, until ten to fifteen or twenty loads of ashes are raised in one heap. The workmen have agreed to complete the process for a shilling each load of ashes.

This is a cheap way of raising manure ; besides, at the same time, removing a nuisance : and no man having such an opportunity in his power ought to neglect making at least an experiment. On some soils ashes are found in themselves an excellent manure ; and, perhaps generally, ashes raised in this way would be found highly advantageous as bottoming for farm-yards and dunghills.

6.

MANURE.

GRASSLAND.

JUNE

7.

7.

GRASSLAND.

JUNE 28. The herbage of the dairy pastures (see GRASSLAND, vol. I. also MIN. 107.) consisting of rye-grass, white clover, and a few of the taller grasses, having run up in patches to seed, I had it swept over with the fith; partly to improve the seed, which would soon have been much incumbered by the dry strawlike bents; and partly for the fodder, this year of scarcity of grass for hay.

Shut them up for a few days to freshen: gave one shilling an acre for mowing; and today have finished carrying fourteen jags (about nine or ten tons) of hay off forty-seven acres.

The hay is more than tolerable; for the pastures not having been too hard stocked, there was a fine bottom of white clover; which mixed with the fresh stalks of the blade-grasses, likewise cut in the fulness of sap, and the whole made slowly in small cocks, the hay is green and sweet to a great degree; and will next winter no doubt be worth from fifty shillings to three pounds a ton.

Nine tons of hay at 55s. - - £. 24 15 0

Mowing 47 acres £. 2 7

Making and carrying,

about - - - 2 7 4 14 0

Neat profit £. 20 0 0

besides

besides the fightlines; the improvement of the seed; and the prevention of thistles and other weeds from seeding on the ground, and being blown about the neighbourhood.

7.

GRASSLAND.

8.

JULY 10. Perhaps cattle and sheep should be kept separate.

STOCKING
PASTURES.

While the dairy pastures were swept (see last MIN.) the cows were shifted into a grazing ground; but, notwithstanding there was a good bite, and the grass apparently of a desirable quality, they did not fill themselves, nor milk so well as they did before they were put in, and after they were taken out; though their pasture afterwards was apparently of a worse quality. But in the grazing ground were a flock of sheep; whilst the dairy pastures had nothing in them except the cows and a few horses.

CATTLE.

SHEEP.

Mr. Thomas Baldwin, of North Walsham, says, that having sheepfolded a piece of ground, which, a drought setting in, he could not, as intended, break up; a good bite of grass came up where the sheep-fold had stood. He put his

9.
SHEEP.

his cows in to feed it off: they would not touch it: he turned his horses to it, and they eat it into the very ground.

9.

FENCE-
WALLS.

JULY 21. Perhaps plant *ivy* against *sea stone walls* to prevent their bursting.

Part of a wall before a cottage at Thorp is overgrown with ivy, part of it naked: the former is firm and upright—the latter burst in many places; so as not to be made strong again without a considerable part of it being taken down and rebuilt.

10.

MANURE.

JULY 21. In December last, some shovellings of a sheepfold were set experimentally upon a piece of grassland:—this hay-time I observe the swath there is nearly double to that in any other part of the piece.—The soil a good sandy loam.

GRASSLAND.

11.

SHEEPFOLD.

JULY 29. Mr. Samuel Barber has, upon his Staninghall farm, a piece of olland* barley,

* *Olland*-barley; that is, barley sown after *Olland*; a con-

a small part of which was sheepfolded once in a place; the rest undressed.

12.

Where the fold stood the barley is, I apprehend, double the crop. The vestiges of the fold are discriminable to an inch. The crop is thicker upon the ground, the straw stronger and taller, and the ears fuller and much larger. There cannot be less than three coombs an acre gained to the first crop, by one night's sheepfold; besides an advantage to ensuing crops. The soil a light scorching loam.

BARLEY.

12.

AUGUST 3. The turnep crops of this neighbourhood have suffered considerably this year from a species of caterpillars—provincially “black cankers”—which prey upon the plants after they are in rough leaf; eating them down to the ground; and totally destroying the crop wherever it happens to be attacked by these voracious reptiles.

TURNEP
CATERP.

It is observable, however, that the destruction is partial; many pieces being left un-

traction of *old land*,—and is now applied universally to lays, or sward, produced by CULTIVATED GRASSES.

touched,

12.

TJRNEP
CATERP.

touched ; and those which are affected are only partially eaten, in irregular plots ; which perhaps are entirely eaten off, while the rest of the piece remains uninjured.

It is still more remarkable that the sea-coast has suffered most ; the mischief decreasing with the increased distance from the sea. Perhaps the parent-insects were brought by the north-east winds which have prevailed this year.

That insects attempt, at least, to cross the ocean, seems evident from the observation of Mr. Arthur Bayfield, of Antingham, who says, that being on the sea-shore some years ago, he saw myriads of flies, *resembling* the cantharides, left dead upon the beach by the tide. These, probably, being becalmed, or meeting with contrary winds in their passage, became spent, dropt into the sea, and were drowned.

Mr. Thomas Shepherd, of Northreps, says, that this year a piece of early-sown turneps was seen to be almost covered with a species of fly resembling the grey horse-fly ; with this difference, that the head is black and the body yellow. From former observations of this kind he foretold the destruction of that piece of turneps by the “ cankers : ” — and his apprehensions were too well grounded ; for it was
totally

totally eaten up by them. What he adds is remarkable; he says that these flies were brought by a long-continued north-east wind, and that the wind getting round to the south, there was not, in a few hours, a single fly to be found in the piece.

It is highly probable that these insects travel in flights, and that they are led about from place to place by the winds, or by other circumstances.

To prevent or check the devastation committed by the caterpillars, various devices have been practised by farmers whose crops were assailed by them. Some rolled with a heavy roller. Some sowed lime over the plants. Others employed ducks; and others women and children to pick them off the plants.

Mr. Arthur Bayfield found ducks the most efficacious; he collected seventy or eighty, and saved several acres of turneps through their means. He fed them twice a-day with corn, under an idea that "cankers," alone, would kill them.

Mr. William Barnard found hand-picking answer his purpose. Five women and boys picked over ten or eleven acres of hoed plants in one week; about eighteen pence an acre.

12.

TURNEP
CATERP.

Mr. James Carter, having one side of a close entirely eaten up, and the other side, which had been sown later, entirely free from caterpillars, dug a trench between the two parts, and put some lime in the bottom of it, by which artful expedient he saved his turneps: for the caterpillars, in attempting to cross the trench in search of fresh pasturage, fell among the lime, and were smothered. Mr. Bayfield says, that if the weather be dry, digging a trench without the lime will stop them: for the side of the trench being dusty they cannot crawl up, but roll back to the bottom; and by repeated attempts become exhausted.

The farmers who hoed their plants while the caterpillars were upon them, and without using any precaution, inevitably lost their crops, besides losing the expence of hoeing; for after the operation the whole of the caterpillars fell of course upon the comparatively few plants which then remained, and presently eat them down to the clods.

In this case, the only remedy is to plow up the ground and sow a-fresh; an expedient which has been obliged to be practised on, perhaps, some hundred acres of turnep-ground this year.

About

About twenty years ago, it seems, the whole country was stripped by this means ; the first sowings being destroyed throughout the county.

13.

TURNEP
CATERP.

13.

AUGUST 3. It has long been considered as one of the first of vulgar errors among husbandmen, that the berbery-plant has a pernicious quality (or rather a mysterious power) of blighting the wheat which grows near it.

BERBERY.

This idea, whether it be erroneous or founded on fact, is no where more strongly rooted than among the Norfolk farmers ; one of whom mentioning with a serious countenance an instance of this malady, I very fashionably laughed at him. He, however, stood firm, and persisted in his being in the right ;—intimating, that so far from being led from the cause to the effect, he was, in the reverse, led from the effect to the cause : for observing a stripe of blasted wheat across his close, he traced it back to the hedge, thinking there to have found the enemy ; but being disappointed, he crossed the lane into a garden on the opposite side of it, where he found a large berbery-bush in the direction in which he had looked for it. The mischief, according to his

WHEAT.

13.
BERBERY.

description, stretched away from this point across the field of wheat, growing broader and fainter (like the tail of a comet) the farther it proceeded from its source. The effect was carried to a greater distance than he had ever observed it before; owing, as he believed, to an opening in the orchard behind it to the south-west, forming a gut or channel for the wind.

Hearing him thus particular in his description, and knowing him to be accurate in every circumstance as to situation, I asked him how he accounted for the mischief. He answered to this effect: the berbery and wheat blow at the same time, and the dust, or farina, of the berbery being blown over the wheat when in bloom, is poisonous to it, and causes the blight.

This, I confess, staggered my incredulity; for if the farina of vegetables be carried to a considerable distance, and at that distance have a quality of fructuosity towards their own species;—and if some vegetables are salubrious, others poisonous, to the animal creation, why may not the farina of one vegetable be carried to a considerable distance, and there become poisonous to the fruitfulness of another of a dissimilar genus * ?

* This, however, is evidently not the cause; for I have
since

Being desirous of ascertaining the fact, be it what it may, I have enquired further among intelligent farmers concerning this subject.— They are, to a man, decided in their opinion as to the fact; which appears to have been so long established in the minds of principal farmers, that it is now difficult to ascertain it from observations; berbery plants having (of late years more particularly) been extirpated from farm-hedges with the utmost care and assiduity: one instance, however, of mischief, this year, I had related to me, and another I was myself eye-witness to. Mr. William Barnard, of Bradfield, says, that this year seeing a patch of his wheat very much blighted, he looked round for a berbery-bush; but seeing none conspicuous in the hedge, which was thick, he with some difficulty got into it, and there found the enemy. He is clearly decided as to the fact. Mr. William Gibbs, of Rowton, telling me that a patch of his wheat was blighted in the same manner, and that he believed it to proceed from some sprigs of berbery which remained in the neighbouring hedge (which a few years ago was weeded from it) I went to

since observed, that the berbery blows several weeks before wheat shoots into ear.

.13.
BERBERY.

13.
BERBERY.

inspect the place; and true it is, that near it we found three small plants of berbery; one of which was particularly full of berries. The straw of the wheat is black; and the grain, if it may be so called, a mere husk of bran; while the rest of the piece is of a much superior quality.

These circumstances are undoubtedly strong evidence; but do not by any means amount to proof.

HARVESTING
WHEAT.

14.

AUGUST 9. Last night in riding from Norwich, I saw a farmer, at Hainford, *mowing* some wheat, which was dead ripe, and free from weeds. The gatherers immediately followed the sith, and the waggon the gatherers; so that it was harvested at a trifling expence (at a time when all the corn in the country is ripe, and hands of course unusually scarce) and was secured in the barn, without any risque from the weather. This, at a pinch, may be worth imitation.

15.

HAY-CHAM-
BER FLOOR

AUGUST 22. An excellent and cheap hay-chamber floor is made in this country with *clay* and rods.

Finished

Finished one to-day upon a farm at Suffolk.

It measures six yards by eight, or forty-eight square yards.

It took three hundred splints (alder and willow rods, about the thickness of a man's wrist down to that of his thumb) at

1s. 6d.	—	—	£. 0	4	6
Three loads of clay (casting and carriage near)	—	—	0	4	6
A waggon-body-full of straw			0	2	0
Five days of a bricklayer and labourer, at 2s. 6d.	—	—	0	12	6
One ditto to plaister it when it is dry on the under-side,			0	2	6
			<hr/>		
			£. 1	6	0

or sixpence half-penny a yard square.

N. B. The price, by measurement, for labour alone, is four pence half-penny a yard; which is a great deal too much.

This floor was made in the following manner:

The rods being trimmed (namely, the twigs and tops taken off), they were laid across the joists as close to each other as possible. If crooked they were "crippled" (had a chop in the crooked part with a hook or hatchet) so as to

15.

HAY-CHAM-
BER FLOOR.

make them touch every joist, as well as each other. No nails or other confinement.

The clay being well soaked with water, the principal part of it was mixed with long wheat-straw; which was well worked into it by the means of a horse, or man, treading it, and by raking it about with a turnep-hook; the rest made mortar-wise, with a small quantity of short straw.

The rods being bedded, and the clay prepared, the "dauber" laid a plank across the rods to prevent his misplacing them with his feet; and, standing on this, laid on a thick coat of the strawy clay, so as to cover the thickest of the splints about an inch thick, with a dung-fork; working it well in between the crevices of the rods, and making it as level on the top as that rough tool would make it. This done, he went over it again with the mortar-clay, (still standing on his plank) and gave it a thin finishing coat with a trowel. The thickness of the rods and the two coats of clay is about three inches:—the thinner they are the sooner they dry, and the lighter they are for the joists and timbers.

Where, from the uncouthness of the rods, the clay forced through between them, the dauber
with

with a hoe cut it off level with the rods on the under-side, and for this purpose drew his hoe over every part of it—a job presently done.

In the spring, when the floor is thoroughly dry, it is intended to be plaistered on the under-side, to cover the rods, and give it a particular appearance. This will take about a day's work.

A clay floor is preferable in two respects to a boarded one: it is cheaper and *tighter*. Boards, except they be well seasoned, and without they be plowed-and-tongued, and laid down at a greater expence than can be bestowed on a farmer's hay-chamber, will let the dust and seeds through upon the horses and harness; whereas clay renders it as tight as lead.

Mentioning my doubts to the workman as to its duration, observing that the rods, I was afraid, would soon rot;—he answered, that did not signify, for if the straw be well worked into the clay, the floor will remain firm, though the rods be rotten.

Mr. John Baker, of Southreps, whose opinion in this case is decisive, corroborates the idea of clay floors being preferable to boarded ones; and of their lasting a great number of years.

15.

HAY-CHAMBER FLOOR.

16.

16.

WELD.

AUGUST 29. Last year, to try whether weld (*Reseda luteola*—dyer's weed) be an object of the Norfolk culture, I sowed one acre and three-eighths with two pints of turnep-feed, and two pints and a half of weld-feed, the 16th of August.

The soil, a lightish sandy loam, had been plowed three times as a fallow for wheat; gave a fourth plowing; harrowed;—sowed the turnep-feed; harrowed;—sowed the weld-feed; re-harrowed, the horses trotting.

It was hoed at a considerable expence with small carrot hoes; it nevertheless got full of poppies and other weeds.

On one end of the piece, where the turneps were a bad crop, the weld was very good; but, upon the whole, only indifferent.

I am certain that in this experiment the turneps were extremely prejudicial to the weld; and there was no feed from them worth turning the sheep to, until the plants began to run, in the spring; and then, in a few days, they started up, and drew the weld up with them, slender and sickly. I am very clear in that, had the weld been sown alone, and been twice hoed,

the

the crop would have been much better, and the soil left cleaner.

16.

WELD.

I apprehend there is no occasion to leave the plants so thick upon the ground as is usually done. I am persuaded that six or eight inch hoes might be used with propriety in setting out the plants. If so, the expence of hoeing would be little more than that of hoeing turneps.

I am of opinion, from this experiment, as well as from others that I find have been tried in the county, that weld may be raised with considerable profit in Norfolk; especially at present (during the war), when weld is dear; but I am at the same time clearly of opinion, that it is not the interest of landlords to encourage the culture of it, without some rigid restrictions in their leases to prevent their tenants from carrying off their estates such a quantity of vegetable matter, without replacing it with an equivalency of manure, agreeably to the usual covenant relative to hay and straw: for it is not the *corn* only, but the *straw* likewise, that is carried off the premises in the shape of weld: perhaps to the amount of a ton or upwards an acre.

17.

AUGUST 29. Last autumn, in order to ascertain the proper *time of putting ewes to the ram*, I made the following experiment:

SHEEP.

17.
SHEEP.

The 20th September put a score of long-wooled ewes of different ages to a Leicestershire ram, and a score of Norfolk ewes to a Norfolk ram. Being in rather low condition, few of them took the ram till the beginning of October.

The 19th of October put twenty-three long-wooled and forty Norfolk ewes to the same rams, keeping the two breeds separate.

The 20th of November put the same rams to a score of each sort reserved for the purpose.

The early lambs were much the stoutest and best for stores; and grafs lamb was out of season before the late ones were fit for the knife.

But the crones * which took the ram early were not able to support their lambs in winter: for grafs was scarce, and they could not break turneps.

Therefore, this year, all the young ewes have been put to the rams a week ago, and all the old ones are intended for the butcher before this year's grafs be gone: for in a country where turneps are the principal spring food, crones appear to be unprofitable stock.

* Crones—old ewes which have lost their fore teeth.

18.

18.

AUGUST 29. Last autumn, made an accurate experiment on a large scale, with different manures for wheat, on a sandy loam, summer fallowed.

MANURES
for
WHEAT.

Part of an eighteen acre piece was manured with fifteen or sixteen loads of tolerably good farm-yard dung an acre; part with three chaldrons of lime an acre; the rest folded upon with sheep, twice; the first time at the rate of six hundred sheep to a quarter of an acre (see MIN. 1.); the second time thinner.

In winter and spring the dung kept the lead; and now, at harvest, it has produced the greatest burden of straw.

The sheepfold kept a steady pace from seed-time to harvest, and is now evidently the best corned, and the cleanest crop.

The lime, in winter and spring, made a poor appearance, but after some showers in summer it flourished much, and is now a tolerable crop; not less, I apprehend, than three quarters an acre: and in this country, where dung is so singularly valuable for the turnep crop, it is a satisfaction to know that summer fallowing and lime alone will insure a tolerable crop of wheat.

From

18. From these data, the value of sheepfold, *in*
SHEEPFOLD. *this case*, may be calculated.

By MIN. 1. it appears that one hundred sheep manured seven square rods daily. But the second folding was thinner; suppose nine rods, this is, on a par of the two foldings, eight rods a day each folding.

The dung could not be worth less than half a crown a load; and the carriage and spreading ten shillings an acre; together, fifty shillings an acre; which quantity of land the hundred sheep teathed twice over in forty days.

Supposing them to be folded the year round, they would, at this rate, fold nine acres annually; which, at fifty shillings an acre, is twenty two pounds ten shillings a hundred—or four shillings and six pence a head.

In some parts of the island the same quantity of dung would be worth five pounds an acre; which would raise the value of the teathe to nine shillings a head; which, at two pence a head a week, is more than the whole year's keep of the sheep.

It does not follow, however, that all lands would have received equal benefit with the piece in consideration; which, perhaps, had not been folded upon for many years; perhaps
never

never before ; and sheepfold, like other manures, may become less efficacious the longer it is used on a given piece of land.

18.

SHEEPFOLD.

19.

AUGUST 29. In the above-mentioned piece of wheat, I made a comparative *experiment* on the mode of sowing.

SOWING
WHEAT.

Part was plowed-in, agreeably to the common practice of the District, laying up the soil in narrow ridges : part sown on the last plowing, and harrowed in : part put in with Mr. Duckett's drill-plow ; which, from some practical knowledge of it, I had considered to be well adapted to the Norfolk soil.

The sowings being made across the manurings, the two experiments became distinct ; and the results clear and decisive. The time of sowing the 31st of October.

The result of this experiment was not so striking as that of the last. The part sown over the furrow of the plow, and harrowed in, is however, very perceptibly, the worst ; but on comparing the part plowed in with the part drilled, no obvious difference is to be perceived. Had the drills been nine inches instead of twelve inches apart, I am of opinion they

18.

SOWING
WHEAT.

they would have gained a preference ; but, from this experiment, there does not appear to me to be any advantage to be expected from the drill worth changing the custom of the country for.

SEED-
PROCESS.

Last spring I made similar experiments on the use of this implement with peas and barley. During the summer the drills seemed to gain a preference ; but, at harvest, it is a moot point whether the drill or the common plow has the preference : and although these several experiments were seen and attended to by some good farmers of the neighbourhood, I do not find that any of them are so much struck with the result as to be inclined to give up their present practice : nevertheless I am of opinion that this ingenious implement merits further trial. Barley appears to be the crop for which it is most especially adapted in this country.

IMPLEMENT.

N. B. In November last, I attempted to try the six-rowed, or winter-barley, against the common barley, as a winter crop ; sowing some of each sort above ; some under ; and some in drills : but the pheasants, rooks, hares, and other vermin, subverted the experiment, and nearly destroyed the crop : therefore, to save it from disgrace, the scattered remains were plowed up in the spring, and the land sown with common barley.

AUGUST

20.

20.

AUGUST 31. What a variety of enemies TURNEPS.
have turneps in this country! The "fly," the
"canker," the "maggot" (at the root) and
the "anbury," have this year already destroyed
myriads.

The *fly* took them in their infant state;—
the *grub* and *caterpillar* whilst their tops were
yet small; and, now, when their tops have al-
most got their full size, they are hourly dwin-
dling with the *anbury*.

The *grub* in itself would not perhaps be fa-
tal; but the rooks, in order to come at it, pull
up not only the plants which are attacked, but
those also which are free from it; and by this
means clear them as they go.

The *anbury* is a large excrescence, which
forms itself below the apple. It grows, it
seems, to the size of both the hands; and, as soon
as the hard weather sets in, or it is, by its own
nature, brought to maturity, it becomes pu-
trid, and smells very offensively.

At present, the state of three specimens which I
have taken up, and examined attentively, is this:
—The apples of the turneps are just forming
(about the size of walnuts in the husk) while
the anburies are already as big as the egg of a

20.
TURNEPS.

goose.—They are irregular and uncouth in their form, with inferior excrescences (resembling the races of ginger) hanging to them. On cutting them, their general appearance is that of a hard turnep; but on examining them through a magnifier, there are veins, or string-like vessels, dispersed among the pulp. The smell and taste somewhat resemble those of turneps; but without their mildness; having an austere and somewhat disagreeable flavour, resembling that of an old stringy turnep. The tops of those which are much affected turn yellow, and flag with the heat of the sun; so that, in the day-time, they are obviously distinguishable from those which are healthy.

It seems to be an idea among farmers, that the cause of the anbury is the soil's being tired of turneps; owing to their having been too often sown on the same land. This, however, is positively erroneous; for the piece from which I drew these specimens was an old orchard, and never before bore turneps in the memory of man.

Quere—Is it not caused by the above-mentioned or some other grub, that, wounding the vessels of the tap-root, diverts the course of the sap; which, instead of forming the apple, forms this excrescence?

AUGUST

21.

21.

AUGUST 31. One side of an eighteen acre piece of turneps was folded upon; the rest of the piece manured with dung.

TURNEPS:

The part sheepfolded escaped the devastation of the "fly" *obviously* better than the part dunged.—

SHEEPFOLD.

Quere—Were the flies increased by the dung, or were they trodden to death, or shut up and suffocated in their burrows, by the feet of the sheep?

22.

SEPTEMBER 8. Mr. Thomas Drurey, of Erpingham, a man whose opinion is valuable in matters of husbandry, says, that marl is a certain preventative of the *anbury*.—He is also of opinion, with other judicious husbandmen, that reathing the barley-stubble which is intended for turneps, will cause the *anbury*: his land, he says, although it be old-marled land, is by this precaution in general free from *anburied* turneps.

TURNEPS.

23.

SEPTEMBER 12. Mr. William Barnard, of Bradfield, who was born (and resided until

DIBBLING
WHEAT.

D 2

about

23.
DIBBLING
WHEAT.

about three years ago) at Great Ellingham, near Attleborough, gives the following account of the rise and practice of the *dibbling of wheat*.

The dibbling of peas, he says, has been a custom of that part of Norfolk time immemorial; but the practice has not been extended to wheat above eighteen or twenty years; nor has it been in any degree general for more than ten years.

The practice of dibbling wheat probably arose in this manner.—At Deepham, an adjoining parish to Ellingham, lived one James Stone, a labouring man, who was, in that neighbourhood, a noted dibbler of peas, and who cultivated for himself a few acres which he rented with his cottage.—He had three children, who were as expert at “dropping” as the father was at “dabbing;” and having some acre or two of clover-lay, which came in course for wheat, he conceived the idea of dibbling in the seed; probably thinking that he should thereby keep his children from idleness, and save them, at the same time, an unexpected supply of bread.

He accordingly set about putting *his scheme* in execution, and presently brought his neighbours

bours about him. Some of them smiled, and others laughed at his experiment; he nevertheless proceeded with his little corps, and finished his patch.

The land being in good condition, and the work being done in a masterly manner, the plants came up so strong and beautiful as to draw the eyes not only of his fellow-parishioners, but of the whole neighbourhood.

Mr. Barnard well recollects the circumstance; for he passed the close (which lay by the side of a public road) every day in his way to and from school: and says, that he has frequently seen the neighbouring farmers, in their way to market, light at the gate, and go into the piece, to view the crop, which was now become popular.

At harvest the crop proved extraordinarily good; and the dibbling of wheat has, from that time, been more or less practised in this circle of the county: the only one in which the practice is, even yet, become general among farmers.

Enquiring of Mr. B. the proportion which dibbled wheat in that country bears to the wheat sown broad-cast; he says, there is as much dibbled as there can be hands got to put it in; and apprehends that one-half of the wheat

23.
DIBBLING
WHEAT.

about Wyndham and Attleborough is dibbled in; adding, that when wheat is dear the work-people are engaged some months before-hand; and frequently, when they are paid off for dibbling peas in March, they are engaged for the wheat-seed-time.

Succession. A clover-lay once plowed is what is generally made use of for dibbling; it has however been tried, with a considerable share of success, on fallow ground.

Manure. The common practice is to spread the dung, or other manure, presently before the ground be plowed. Some lay it on after the seed is in by way of top dressing. But Mr. B. is of opinion, that setting on the manure in July, and letting it wash into the soil before plowing, is the most eligible way of manuring for dibbled wheat.

Soil process. If the soil be light and the weather dry, the plowman keeps pace with the dibblers:—the holes will not otherwise stand; the sand running in and filling them up. The furrow—provincially “flags”—should be cut about ten inches wide, and be turned over flat and even; and, to make them lay still smoother and firmer, they are rolled pretty hard before dibbling.

The dibbles made use of in this operation are of iron. The acting part is an egg-shaped knob of iron or steel somewhat larger than a pigeon's egg. The smaller end forms the point of the dibble; whilst from the larger rises a string of iron, about half an inch square, and two feet and a half long. The head of it is received into a cross piece of wood (resembling the crutch of a spade or shovel) which forms the handle.

The dibbler makes use of two of these tools; one in each hand; and, bending over them, walks backward upon the flags; making two rows of holes in each. The rows are usually made about four inches apart, and the distance in the rows from two and a half to three inches; namely, four holes in each length of the foot of the dibbler.

The great art in making the holes lies in leaving them smooth and firm on the sides; so that the loose mould do not run in to fill them up before the seeds are deposited. This is done by a circular motion of the hand and wrist; which make a semi-revolution every stroke: the circular motion beginning as the bit enters, and continues until it is clearly disengaged from the mould. The dibbles must

23.

DIBBLING
WHEAT

23.

DIBBLING
WHEAT.

come out clean, and wear bright, or the operation is not perfect.

Another difficulty in dibbling is to make the holes at equal distances; more especially to keep the two rows straight and parallel with each other: for the dibbles being two distinct instruments, it requires some practice to guide them with precision; so as to pierce the flag in the exact point required. To remedy this, couples have been invented to keep the dibbles at a given distance; but this renders the implement complex, and prevents the learner from ever being able to use them singly. A man must be awkward indeed if he does not in a few days without this incumbrance make himself a tolerable master of dibbling.

A middling workman will make two motions, or four holes, in a second.

One dibbler employs three droppers; therefore one man and three children are called a set. Each dibbler takes three flags, which he performs upon by stages thus: He first takes an outside flag, and having gone some yards upon that, he returns; not upon the next flag, but upon the other outside flag of the three; and then finishes his stage by taking the middle one. This is done to keep his three droppers fully

fully employed, and at the same time to prevent his filling up the holes with his feet before the seeds are deposited. Were he to carry but one flag with him, the droppers would have to pass each other repeatedly, and have three times the ground to walk over; whereas by the above contrivance they are always uniformly progressive, and each child finishes its own flag.

The droppers keep up with their dibbler, putting two or three grains of wheat in each hole (but of peas only one); the girls carry the seed in their aprons, the boys in their hats or other contrivance. Out of those they take about half a handful, and deliver the seed into the holes through an aperture made between the first and second fingers. Much time and patience is necessary to teach a child to perform this petty business with propriety and dispatch.

The present price of dibbling a free light soil is nine shillings an acre and beer. It formerly was half a guinea. If the soil be stiff or stony, it is now worth more than that money. The dibbler is a sort of master of his set; for if he has not children of his own, he hires his droppers, giving them sixpence a day each if expert

23.

DIBBLING
WHEAT.

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DIBBLING
WHEAT.

expert hands, or threepence a day if learners; two of them being employed on one flag, each taking one row of holes: so that he pays for dropping, threepence a day for each row of holes. An expert dibbler will “hole” half an acre a day, which at nine shillings is four and sixpence, out of which he pays one shilling and sixpence to his droppers: but one-third of an acre is reckoned a fair day’s work; which at nine shillings an acre is three shillings; out of which paying one shilling and sixpence, he has one shilling and sixpence left for his own day’s work.

Quantity of seed. One bushel to six pecks an acre; and, if the flags crack much in plowing, some throw on half a peck or a peck an acre, broad-cast, before rolling.

Covering the seed. This is usually done by going twice in a place with a bush-harrow, made by drawing thorns into a gate or a large hurdle. Either of these however Mr. B. says, and with reason, makes too large an Implement; for in so large a space as this covers at once, there will be protuberances which it will lay hold of too much, and probably pull up, and hollows which it will wholly miss.—He has usually

usually preferred a waggon ladder, which does not cover more than four or five flags at once; and to finish this business more completely, he always carries a sort of broom in his own hand, when overlooking the work-people; in order to cover more effectually any part which may be partially missed.

The advantages held out. There is a saving of about a bushel and a half of seed; which, when wheat is six shillings or upwards, is alone an equivalent to the extra expence of dibbling.

The rolling and treading is esteemed highly serviceable to the light lands of this country.

The edges of the flags being intimately united by the rolling and the trampling, and the remaining fissures being filled up by the harrow, the grasses are thereby thought to be kept under; and should feed-weeds appear in the spring, the hoe has free admision between double row and double row, to extirpate them; an operation, however, which I understand seldom takes place.

The seed being wholly buried in the body of the flag, there is no "under-corn"; the plants are uniformly vigorous; the straw, collectively, is consequently stouter, and the grain more even, than that which is usually produced from

sowing

23.

DIBBLING
WHEAT.

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DIBBLING
WHEAT.

sowing the seed broad-cast over the rough flag. For in this case, part of the seed falls through between the flags, and being there too deeply buried by the harrows, the young plants are longer in reaching the surface than are those from the seed which happens to fall in a more favourable situation; and which thereby gain an ascendancy they never lose: hence a number of underling plants, and hence the small shrivelled grains, which render the sample unfightly and unsaleable.

Another good effect remains to be noticed, the employment of the poor; and whether we view this in a moral, a political, or a private point of view, it is equally desirable. For the poor's rates of a country village fall principally on the farmer; and if he does not employ the poor, he must support them in idleness; more especially children.—Mr. B. says, that in the circle above-mentioned wheat seed-time is considered, by the poor man, as a second harvest.

Mr. — Smith, of Heavingham, gives a somewhat different account respecting the advantages of dibbling wheat. He says, that he has frequently had eight or ten acres of dibbled wheat in a year; that he has usually made the holes as thick as they could stand,

so as not to disfigure or interfere with one another; and has dropped two bushels, at the expence of twelve or fourteen shillings an acre.

He is clearly of opinion, that dibbling wheat makes the land foul; especially if it is not dibbled thick; and gives a very good reason for this opinion; namely, where corn is thin weeds will be thick. He is positive that the grass gets up more among wheat which is dibbled than among that which is sown broadcast over the rough flag of one plowing: adding, that after dibbled wheat he has usually been obliged to sow turneps the next year, instead of first taking a crop of barley; the common practice of this part of the country. He however acknowledges fully, that the straw of dibbled wheat is stouter, and the grain evenner, and of a better quality, than that from wheat sown broadcast after any process whatever.

Mr. John Baker, of Southreps, spirited and judicious as he is in matters of husbandry, has never had a sufficiently good opinion of dibbling wheat to give it a trial; not even by way of experiment. His chief objection to it is, that in *this* country, where the soil is shallow, and the lays generally grassy, wheat cannot be sown in any manner with propriety on one plowing.

23.

DIBBLING
WHEAT.

23.

DIBBLING
WHEAT.

— — — has tried it two or three different times : the first trial was on a piece of good land, with about three pecks of seed an acre : the crop good, and stood when most of the wheats in the county were lodged.— The last was on a light shallow soil : it proved greatly too thin : not half a crop.

From the sum of this information the dibbling of wheat appears to be peculiarly adapted to rich deep soils ; on which three or four pecks an acre dibbled early, may spread sufficiently for a full crop : whereas light, weak, shallow soils, which have lain two or three years, and have become grassy, require an additional quantity of seed, and consequently an addition of labour, otherwise the plants are not able to reach each other ; and the grasses of course find their way up between them ; by which means the crop is injured, and the soil rendered foul.

Dropping being the most difficult part of the business, it seems to be ineligible to begin with wheat ; the grains of which being small and irregular, are, to a learner, difficult and disagreeable to separate ; whereas those of peas, being larger round and slippery, are more agreeable to the touch, and more easily parted in the hand ; so as to drop one or any other given number into each hole.

It

It further seems ineligible to send children into the field, in any case, until they have practised, at home, in the art of separating the seeds; by which precaution a waste of seed, and a disfigurement at least of the crop, may be prevented. For the same reason it seems proper, that a young dibbler should be exercised on fallow or other fresh-plowed ground not intended to be dibbled, before he be admitted into the field of practice.

23.

DIBBLING
WHEAT.

24.

OCTOBER 10. Last year Mr. John Joy, of Northwaltham, having a piece of turnep-ground which missed, he sowed it with wheat; and, to keep his land in course, laid it down with clover, the seed of which he *sowed in autumn*, presently after sowing the wheat.

SOWING
CLOVER.

I saw the seedling plants early in winter; when they looked remarkably healthy. Towards spring I saw them again; but some severe frosts had cut them entirely down, so as to make it doubtful whether they would recover or not.

I desired Mr. Joy to acquaint me with the result; and yesterday we walked over one of the finest sets of clover that ever grew: not having
been

24.
SOWING
CLOVER.

been yet fed, the heads of the plants now stand above the stubble; but for which a fine swath of clover-hay might be mown.

This is the first instance I have met with of sowing clover-feed over wheat in autumn.

25.

BUILDINGS.

OCTOBER 10. Formerly, a ridiculous practice has prevailed in this country of running up the *peaks of gables* above the roof of the house. In many old houses the coping of the gable stands eighteen inches, perhaps two feet above the thatch or tiling. The effect of it is, the water of driving rains is collected by this unnecessary elevation of the wall, and either drains through between the gable and the roof, or, if an offset be made to prevent this, soaks into the wall itself.

An old-fashioned "flue" rotted by this means, was the other day, upon this estate, thrown down by a gust of wind.

I mention the circumstance the rather, as this absurd custom is not yet altogether laid aside; though the flues are now made much lower than formerly. In strict propriety, the coping of the gable ought to be level with the covering.

For

For common buildings, when the covering is of tile or slate; more especially for a lean-to liable to the drip of the main roof; the best way is to continue the covering over the gable or end-wall; which is thereby effectually preserved at an easy expence.

25.

BUILDINGS.

26.

OCTOBER 18. This morning rode to Winton to see some labourers from the Attleborough side of the county dibble wheat. They had finished.

DIBBLING
WHEAT.

Mr. Elmer shewed me what they had done for him:—the plants come up very strong, and look healthy. The quantity of seed, six pecks an acre; dropping four or five grains in a hole.

Mr. E. mentioned one advantage which did not occur to me before: the feedage of the lays from July to October.

27.

OCTOBER 25. On Wednesday 17th instant went to the first day of the *Fair of St. Faith's*; a village near Norwich, where one of the largest fairs in the kingdom is held annually on that day for cheese, butter, and a variety of wares; but most especially the first; which is brought in great quantities out of Suffolk to supply this

MARKETS.

27.
CHEESE.

country during the winter months; when a Norfolk cheese is not to be purchased in this part of the county.

CATTLE.

The first day of this fair also draws together a good show of cattle; principally "home-breds;" either for store, or for fattening on turneps the ensuing winter: for which purpose, a show of Scotch bullocks are also exhibited upon a rising ground at a small distance from the Fairfield.

The sale of Scotch cattle continues for a fortnight, or longer time, until this quarter of the county be supplied with that species of stock. (See BULLOCKS, Vol. I)

FATTING
CATTLE.

Yesterday, attended the bullock fair.

There are fewer cattle this year than has been known for some years past (about four hundred upon the Hill yesterday), owing chiefly to a great many having been killed by contract for the Navy; a thing not practised before in Scotland; and there were yesterday a greater number of buyers in the market than usual (about fifty of the principal farmers in the county); so that the Scotchmen had the game in their own hands.

The principal drovers are Tate, Wigglesworth (Lord Galloway's steward), Moffatt, Campbell, Stewart.

It

It is astonishing to see the state and condition of the cattle: they look as fresh and as sleek as if they had not travelled a mile from home: some of them tolerable beef. Even so high as eleven pounds a piece was asked for some bullocks; it was however to choose four out of a large drove: but ten pounds was asked to draw fifteen or twenty.

Mr. John Baker bought six spayed heifers, which he drew out of a lot of thirty, at 7*l.* 15*s.* a head; and another neighbour drew twenty-one of the remainder of the lot at 7*l.* a-piece: he afterwards bought seven of an inferior quality at 6*l.*

There were half a score in the fair so low as 4*l.* but the price in general ran from 6*l.* to 9*l.* a head; for cattle which will fat to from forty to sixty stone; but high as these prices are, Mr. Tate (the oldest drover) says; he has known them some years ago twenty or thirty shillings a head dearer than they are even this year.

Each drover hires meadows or grazing-grounds in proportion to his quantity of cattle; —the farmers in the neighbourhood preserving for the purpose a full bite of grass; for which the Scotchmen pay very amply. The charges on sale must run high. The number of

27.

FAIR OF
ST. FAITH'S.

27.

FAIR OF
ST. FAITH'S.

attendants, the high price of grafs, and treating the farmers, "to the amount perhaps of a couple of guineas a day," must lower the neat proceeds very considerably, even of each bullock taken separately*.

The drovers do not bring their whole flock on to the "Bullock Hill" at once; but let them remain in the pastures until they are wanted; nor do they bring very large droves at once into the country; but keep them back in Lincolnshire, or perhaps in Scotland, until they see how the demand is likely to prove.

I did not learn the annual demand on a par of years; but was told that Tate alone brings some thousands every year into this country.

The larger bullocks are principally of the Galloway polled breed, and most of them very handsome; in general four or five years old; mostly black, some brindled, some dun, and some few red. (See article BULLOCKS, Vol. I.)

28.

DIBBLING
WHEAT.

OCTOBER 27. This morning rode again to Witton to see some work-people dibble wheat; and fortunately found them at work.

* The charges of drift from Scotland to Norfolk are, I have been told, from five shillings to fifteen shillings a head, according to the size of the bullock.

One

One man and one young woman dibbled, while three women and three girls dropped.

They proceeded thus : the man carried three flags, the women two. The man was followed by one woman, taking the first flag, and three girls taking among them the remaining two. The woman was followed by the other two women, each of them taking one flag. When the weather holds fair, the set do about three quarters of an acre a day, at ten shillings and sixpence an acre.

The man, the woman dibbler, and the two women "head-droppers," come from the Suffolk side of the county : the other woman and the girls are of this country ; this being their first season. One of them drops very badly ; sometimes putting six or seven "kernels" in a hole ; besides scattering a great many upon the surface. This shews the impropriety of suffering children to come untutored into the field. The head-droppers do it very quick and very neatly ; dropping two, three or four kernels in each hole ; and about five pecks an acre.

The distance of the holes, and the method of dibbling and dropping (except the arrangement of the droppers), exactly the same as de-

28.

DIBBLING
WHEAT.

28.

DIBBLING
WHEAT.

scribed by Mr. Barnard; whose account is, I am now fully convinced, a very faithful one.

The seed was brined and limed.

The droppers carried their seeds in boys hats sewed up about half way across, leaving an opening sufficient for the hand, with a string by way of a bow or handle. A bushel with the seed stood in the middle of the close; out of this they replenished their hats, every time they passed it.

The soil lightish loam (too light I am afraid to be dibbled with wheat), but had been marled last year. It is a second year's lay, and was pastured this summer.

It is plowed fleet, and very badly, the flags being much broken, and very uneven: were it plowed a little deeper, which I apprehend it might be with safety, the flags would not break so much, and there would be a better bed for the seed. The dibblers are obliged to keep a light hand, and make their holes shallow, lest otherwise they should strike their dibbles quite through the flags.

The flags are rolled before and "bushed" after dibbling; the latter with a harrow made of a strong large hurdle, covering better than half a rod at once.

The

The plow and roller keep time with the dibbles; for if much rain fall upon the flags they daub, and are difficult to dibble; if the weather prove dry, the sand runs in and fills up the holes as fast as they are made.

28.

DIBBLING
WHEAT.

29.

OCTOBER 28. In May last I made an experiment with *lime for turneps*, by spreading a chaldron of lime (at the rate of three chaldrons an acre) across each of two pieces of turnep fallow, and marked the stripes with stumps.

MANURE.

TURNEPS.

No apparent benefit arose from the lime until the late heavy rains fell; since which the plants have flourished, and the good effect of the lime is become evident.

In March last I also made a similar experiment with *lime for barley*; but the crop did not, in any stage, receive apparent benefit from it. The summer, until after the barley had finished its growth, was dry.

BARLEY.

In the experiment with *lime for wheat* (see MIN. 18.) the crop received no apparent benefit from the lime until the soil had been moistened with *summer rains*.

WHEAT.

From these and other observations I am of opinion, that lime does not act as a manure un-

LIME.

29.
LIME.

til it has been thoroughly flaked in the soil ; and, from the last mentioned incident, it seems as if the rains of *summer* were necessary to promote its operation.

30.

FURZE-
FOOD.

NOVEMBER 6. In a furze-ground, in which a large plot was cut down last winter, there is now a crop of young shoots from two to two and a half feet high : if these were now mown (which if the stubs be cut tolerably level they might be with great ease) there would be I apprehend two load of tender succulent herbage an acre.

If furze-tops be that hearty and wholesome food they are represented to be, how easily and with what advantage they might be in this manner collected : Cut the stubs low and level ; mow ; and bruise the herbage with a broad wooden wheel in the cyder-mill manner.

Lands which will afford no other crop will produce furze ; and although poor lands would not throw up shoots like those alluded to, the crop might, no doubt, be mown, and the shoots, if very short, be collected in a receptacle at the heel of the sith.

men-

I mention this incident, and communicate my reflections upon it, the rather, as I have not met, either in theory or practice, with the idea of collecting furze-food with the fische; the only thing wanted, perhaps, to bring it into common use.

30.

FURZE-
FOOD.

31.

NOVEMBER 10. The *Bullock Hill* at St. Faith's is said to receive no benefit from the *teatbe* of the bullocks which every year are shewn upon it daily, during a fortnight or three weeks.

MANURE.

This year it was wheat; and if one may judge from the stubble (notwithstanding the wheat was dunged for), the crop was a very indifferent one.—The soil a lightish sandy loam.

This is an interesting fact. It is said to be owing to the worthlessness of the teathe of "drove bullocks." This I much doubt, however; for the bullocks being many of them in high case, and kept in grazing-grounds about St. Faith's, some of them perhaps within a quarter of a mile of the Hill, the driving is little more than the driving of sheep to a fold. Some of them may, no doubt, come on to the Hill immediately from Scotland; and they are all of them of course driven more or less; and there may be *some* truth in this opinion.

That

31.

FAIRSTEAD.
TEATHE.

That the teathe of lean stock, and more particularly of cows, is much inferior to that of fatting bullocks, is a fact universally acknowledged throughout this county; and this may in some measure be accounted for from the oleaginous matter carried off by the milk of cows, and imbibed by the vascular carcases of lean stock in general. On the same principle, if stock be hard driven, and much exhausted by perspiration, and want of regular nourishment, their teathe may become insipid and of little use to land; consequently this reasoning may in part be applicable to the Bullock Hill at St. Faith's: but, as before has been observed, there are numbers that come in good condition, and from good pastures, at a very small distance from the Fair-hill, and there is no obvious reason why the teathe of those should not be nearly equal to that of other fatting cattle: therefore, upon the whole, it seems probable that driving alone does not produce this interesting fact.

MANURE.

May we not venture to think it possible that land may be fatiated, or tired, even of the dung of cattle? The Hill in question has been the site of a large fair for cattle during time immemorial: perhaps, were the fair removed and the soil manured with lime, marl, or such other

other *new* manure as experience would point out, it might continue to throw out great crops for many years.

This is a subject worth investigating; for upon old grazing grounds, which have been fed and teathed with cattle during a length of time, the dung which falls from them cannot, on this hypothesis, be of any use to the land; consequently the stock may, without injury to the pasture, be driven off in the night-time to teathe some arable land; or the dung may, with advantage, be collected and carried off; whilst by mould, ashes, foot, &c. the grassland may receive improvement.

31.
MANURE.

GRASSLAND.

32.

NOVEMBER 17. To-day compleated the "roofing" of a reeded barn.

THATCHING
WITH REED.

I have attended particularly to the method of laying the reed, and of setting on the "roofing" of this building.

The method of laying reed is this:

No laths being made use of, a little of the longest and stoutest of the reed is scattered irregularly across the naked spars, as a foundation to lay the main coat upon: this partial gauze-like covering is called the "fleaking."

Or

32.
LAYING
REED.

On this fleaking the main covering is laid, and fastened down to the spars by means of long rods — provincially, “sways” — laid across the middle of the reed, and tied to the spars with rope yarn; or with “bramble bonds;” which, formerly, were much in use; but which are now pretty much laid aside, especially for new roofs.

Reed is not laid on in longitudinal courses, in the manner that straw-thatch is usually put on, nor is the whole eaves set at once. The workman begins at the lower corner of the roof, on his right hand for instance, and keeps an irregular diagonal line, or face, until he reach the upper corner to his left.

A narrow eaves-board being nailed across the feet of the spars, and some fleaking scattered on, the thatcher begins to “set his eaves,” by laying a coat of reed; eight or ten inches thick, with the heads resting upon the fleaking, and the butts upon the eaves-board. He then lays on his sway (a rod about the size of a small edder) about six or eight inches from the lower points of the reed; whilst his assistant, on the inside, runs a needle, threaded with rope yarn, close to the spar; and, in this case, close to the upper edge of the eaves-board. The
thatcher

thatcher draws it through on one side of the sway, and enters it again on the contrary side, both of the sway and of the spar: the assistant draws it through; unthreads it; and, with the two ends of the yarn, makes a knot round the spar; thereby drawing the sway, and consequently the reed, tight down to the roof: whilst the thatcher above, beating the sway and pressing it down, assists in making the work the firmer. The assistant having made good the knot below, he proceeds with another length of thread to the next spar; and so on till the sway be bound down the whole length; namely, eight or ten feet.

32.
LAYING
REED.

Another stratum of reed is now laid on upon the first, so as to make the entire coat eighteen or twenty inches thick at the butts; and another sway laid along, and bound down, about twelve inches above the first.

The eaves being thus completely set, they are adjusted and formed; not square with the spars, but nearly horizontal: nor are they formed by cutting; but by "driving" them with a "legget;" a tool made of a board eight or nine inches square, with a handle two feet long, fixed upon the back of it, obliquely, in the manner of the tool used by gardeners

32.
LAYING
REED.

deners in beating turf. The face of the legget is fet with large-headed nails to render it rough, and make it lay hold of the butts of the reed.

Another layer of reed is laid on, and bound down by another sway, somewhat shorter than the last; and placed eighteen or twenty inches above it; and above this another and another, continuing to shorten the sways until they be brought off to nothing, and a triangular corner of thatching formed.

After this the sways are used their whole length, whatever it happens to be, until the workman arrives at the finishing corner.

By proceeding in this irregular manner seams between the courses are prevented; and unnecessary shifting of ladders avoided.

The face of the roof is formed and adjusted, like the eaves, by driving the reed with the legget; which operation, if performed by a good workman, not only gives the roof a beautiful polished surface, but at the same time fastens the reed; which, being thickest towards the butts, becomes, like a tapering pin, the tighter the farther it is driven.

Reed running from four to six or eight feet long, the heads meet at the ridge of the roof, whilst

whilst the butts are still at a distance from each other. For this reason, as well as for that of the wear being less toward the ridge, the shortest (which is generally the worst) reed is saved for the upper part of the roof. But even supposing the uppermost courses to be only four feet long, and that the heads (belonging to the two sides) be interwoven in some degree with each other, the butts will still remain six or seven feet asunder; and the ridge of the roof consequently be left in a great measure exposed to the weather.

To remedy this inconveniency, and to give a finish to the ridge, a cap—provincially, a “roof”—of straw is set on in a masterly, but in an expensive manner.

In this operation, the workman begins by bringing the roof to an angle with straw laid long-way upon the ridge, in the same manner a rick is topt up; and to render it firm, to keep it in its place, and to prevent the wind from blowing it off, or ruffling it, he pegs it down slightly with “double broaches”; namely, cleft twigs, two feet long, and as thick as the finger, sharpened at both ends, bent double; perhaps with a twist in the crown; and perhaps barbed, by partial chops on the sides, to make them hold in the better.

32.

LAYING
REED.SETTING ON
ROOFLETS.

This

32.
SETTING ON
ROOFLETS.

This done, the workman lays a coat of straight straw, six or eight inches thick, across the ridge; beginning, on either side, at the uppermost butts of the reed, and finishing with straight handfuls laid evenly across the top of the ridge.

Having laid a length of about four feet in this manner, he proceeds to fasten it firmly down, so as to render it proof against wind and rain. This is done by laying a "broachen ligger" (a quarter-cleft rod as thick as the finger, and four feet in length) along the middle of the ridge, pegging it down at every four inches with a double broach, which is first thrust down with the hands, and afterwards driven with the legget, or with a mallet used for this purpose. The middle ligger being firmly laid, the thatcher smooths down the straw with a rake and his hands, about eight or nine inches on one side, and, at six inches from the first, lays another ligger, and pegs it down with a similar number of double broaches: thus proceeding to smooth the straw, and to fasten on liggers at every six inches, until he reach the bottom of the cap. One side finished, the other is treated in the same manner; and the first length being completed, another and another length is laid, and finished as the first;

first; until the other end of the ridge be reached.

32.

SETTING ON
ROOFLETS.

He then cuts off the tails of the straw, square and neatly with a pair of shears, level with the uppermost butts of the reed; above which the cap (or most properly the ROOFLET) shews an eaves, of about six inches thick.

Lastly, he sweeps the sides of the main roof with a bough of holly; and the work is completed.—(For the expence, see BUILDINGS and REPAIRS, Vol. I.)

33.

NOVEMBER 17. A very secure way of *laying pan-tiles* is sometimes practised in this country.

BUILDINGS.

Having nailed on the pan-tile laths, the tiler distributes reeds, so as just to touch each other, between the pantile-laths; and, to keep them in their place, inserts one end of a piece of old plastering lath or other splinter, under the tyling-lath; presses it down upon the reed; and inserts the other end under the next lath; weaving, as it were, these splinters between the pan-tile laths and the reed.

Upon the reed he spreads a coat of mortar, and on this lays the tiles.

For dairy or other lean-to's, and for common garrets, the reed is covered on the inside with

33.

LAYING
PAN-TILES.

a coat of plastering; which, with the spars, &c. being white-washed, gives a neat appearance at a very trifling expence; and keeps the room as free from dust as if it were lathed and ceiled.

This is not a common practice; but it is a very good one; and is much cheaper than the ordinary practice of "interlathing" with plastering laths.

34.

HEDGES.

NOVEMBER 19. It is not the earliest-done hedging which makes the strongest shoots from the stubs. A piece of hedging was done on the lands late Mr. —'s in the month of April. The face of the ditch stands remarkably well; and the shoots of white-thorn, cut down close to the face, are uncommonly numerous, and large; some of them being near five feet high.

Perhaps there is an advantage in cutting thorns at that time of the year. When they have been cut off in winter, the spring air has no surface to act upon; except the stump, which barely shews its head above ground: whereas those which stand till the sap begins to stir, have, by their quantity of surface, roused the

the sap in the root, without having yet exhausted any of it; consequently when the top is taken off, the stub throws out many and strong shoots.

34.

TIME OF
CUTTING
HEDGE-
WOOD.

Therefore, if this reasoning be good, there is a judicious moment for cutting hedges and underwoods: namely, when the sap has begun to rise, but before any part of it has been exhausted: and perhaps this time is when the tree or shrub is beginning to bud: the young quick against Suffield Common was cut in this state, and the shoots are remarkably strong*.

35.

NOVEMBER 23. Having frequently seen the mischiefs done to the lean-to porches of barns; by loads of corn being drawn furiously against them in harvest; I have long wished to try some method of prevention.

BUILDING.

In building a new barn at Antingham, I threw the ends of an old beam into the jambs of the side-walls; so as to reach across the floor, at the entrance of the porch; low enough

CHECKBEAM

* There is however a disadvantage in cutting thorns intended for hedging materials in this state; as they are less durable than when they are cut in winter, when the sap is down.

35.

CHECKBEAM

to take the top of the load, and high enough to be out of the way of the flail; setting a man with his flail to give the workmen the proper height.

I find, however, that either the thrasher, or the bricklayer, has made a mistake; for yesterday the thrasher told me, that he frequently hits his flail against the beam.

The height from the floor, I find, is nine feet; six inches more, he says, would be high enough; however, he being a middle-sized man, a foot may be necessary: and ten feet may perhaps be taken as a general height.

The mischief is usually done by large loads; to draw in which (especially if the barn-floor lies much higher than the yard) the horses are obliged to exert their utmost strength; but the load being once landed upon the floor, no farther exertion is necessary; nevertheless the horses being roused and spirited, or not under command, rush furiously on till they come to a check; which is generally the roof of the porch. A small load requires no extraordinary exertion, but is drawn in deliberately, and the horses of course are stopped at pleasure. The height of a pair of full-sized barn-doors is fourteen feet, and a high load will nearly touch the plate. Twelve feet high is but a small load. Therefore,

fore, in every respect, ten feet high is a proper height for a CHECK-BEAM.

35.
CHECKBEAM

36.

NOVEMBER 25. Oaks are observed to grow best, and make the finest plants and the most beautiful trees, when they are raised undisturbed from the acorn. The oak having naturally a strong tap-root, it is almost certain death to remove a large plant which has not been transplanted or tapped whilst young: nevertheless if the tap-root has been properly taken off from the seedling plant, it may afterwards be removed at pleasure, with safety.

PLANTING.

Oaks may be tapped by taking up the plants and taking off the tap-root with a knife, or it may be done as they stand, with a tapping iron, or even a common spade ground to an edge. This, being introduced at a proper depth beneath the surface of the ground, cuts off the tap-root; leaving the principal part of the lateral horizontal fibres undisturbed. When the plants have got large (four or five years old for instance), this is perhaps the safest way of treating them; for the lateral shoots in this case receive no check whatever, but continue to throw up a regular supply of sap to the plant;

F 3

whereas

36.

TAPPING
OAKLINGS.

whereas by taking them up and removing them into a fresh situation, they are several days before they begin to work; in which time the plant may receive irrecoverable injury.

A feed-bed of oaklings, five years old, I treated in this manner: In March-April tapped them all with common spades, ground sharp; pruned such as were in any degree straight; and headed down the rest near the ground, to throw out straight shoots to be trained.

Not a plant I see is dead.

Had there been more of them cut down, the effect would have been still better.

37.

PLANTING.

NOVEMBER 25. A striking instance of success in *transplanting large oaks* for standards occurs on Gunton Common. Scarcely a plant, of some thousands, has miscarried, and very few which do not flourish.

A person who had some share in the business of this plantation tells me, that it was the employment of two men and a couple of horses, almost all the first summer after they were planted, to water them; not by a pailfull, but by a hoghead, at once; which served for the summer.

This

This was a rational method; a pailfull only tantalizes and balks the plant; whereas a hog-head deposited at its root affords a natural and regular supply, to be drawn up leisurely by the sun during the course of the summer.

37.

PLANTING.

38.

NOVEMBER 25. The ash delights in a moist situation, and will thrive even in an undrained moory soil. How healthy and luxuriant are those on Gunton Common, which grow upon a low moory swampy part; almost upon a level with the water; and even those on the ozier-beds vie with the aquatics.

THE ASH.

The ash is a thirsty plant. The road under an ash is observed to be always comparatively dry; and it is probably from this absorbent nature, that it is so great an enemy to the herbaceous tribe. Turneps, a succulent plant, starves under the ash; and corn never thrives in its neighbourhood.—Clover, however, *seems* to be an exception to this theory.

It is nevertheless an undoubted fact, that the ash is a destructive enemy on arable land; and it is highly improper to plant it in hedges. It ought to be planted in waste nooks and corners; or, perhaps, for two reasons, on un-

38.

THE ASH.

improvable swamps, and on the springy sides of hills: it would be rendering them useful as sites of plantations; and, perhaps, by its absorbent nature, would render them firm.

THE ALDER.

The alder, on the contrary, is observed to make the ground it grows on still more rotten and boggy: it ought therefore, for two reasons, never to be planted; namely, the injury to the land, and its own worthlessness.

39.

MARKETS.

NOVEMBER 26. This morning took a ride to see *Holt Fair*.

This is a fair for "homebreds," or Norfolk stock only; no Scotch drovers frequenting it.

A neighbour bought nine three-year-olds (coming), five of them steers, four spayed heifers, forward in flesh, at 4*l.* 7*s.* 6*d.* a piece.

A farmer in the neighbourhood bought two of the same age, but lean, though larger, and not out of condition, for 7*l.*

Some kind-growing two-year-olds (coming) were asked fifty-five shillings a piece for.

Cows and calves fell very low in Norfolk. They were sold to-day from about fifty-five shillings to three pounds ten shillings a couple.

It is also observable, that lean stock—"straw-racks"—fell very low in this country, at this time

time of the year; while such as are forward enough to be finished with turneps, or with the addition of a little spring-grass, so as to be got early to market, fetch astonishing prices. Witness the forward cattle to-day, and the bullocks at St. Faith's.

The reason is this:—A farmer has so many more acres of turneps than he wants for his present stock;—he must therefore either run the risque of selling his turneps, or buy stock which he can finish in the spring, otherwise he will be overstocked the next year.

It is observable that the heifers (of the nine above-mentioned) are forwarder than the steers; insomuch that the purchaser hopes to finish them with turneps; but the steers he expects will require some grass at the spring of the year. It was an observation made, and agreed to, that the grazing-grounds about Foulsham (where these came from) fatten heifers faster than they do steers. In corroboration, a bystander said, that he this year sent a parcel of young-stock to these grounds; the heifers came home almost meat, the steers little better than when they went.

This, if a fact, is highly interesting.

39.
HOLT FAIR.

CATTLE.

GRASSLAND.

40.

FATTING
CATTLE.

40.

NOVEMBER 28. How profitable are the little *Iſle-of-Sky Scots* to the Norfolk farmer, who has rough meadows for them to run in?

— — — had eleven bought laſt Hempton-green fair (juſt twelve months ago) for three guineas a piece. They were kept entirely on ſtraw and ruſhy graſs, which nothing elſe would have eaten, until the month of May; when they were turned into ſome Norfolk meadows, (worth about ten ſhillings an acre) where they remained until September: ſince when they have been at good lattermath. They are now ſome of them quite fat, and the reſt nearly ſo; one with another, they are worth about fix pounds a piece.

Suppoſing each occupied an acre of meadow, which (with town charges) reckon at - - 0 12 0

Straw over and above the dung - - 0 5 0

Ten weeks lattermath, at 10 ſhillings

(the price for ſuch cattle) - - 0 10 0

£ 1 7 0

A neighbouring farmer bought a parcel at the ſame time, and at the ſame price; alſo ſome reſuſe ones ſo low as five-and-twenty ſhillings

shillings a piece; two of which he sold a few days ago for eleven pounds four shillings.

40.
FATTING
CATTLE.

These, however, were followers at turneps the first winter. In summer they were sent to a grazing-ground: since harvest they have been in the stubble and "rowens," at good keep.

His other bullocks had nothing but straw in winter; were shifted about in the meadows during summer; since harvest they have been in the stubbles; and are now at turneps. They have grown very much, and are now getting on very fast.

It is observable, however, that all these Scots were bought in very cheap.

41.

DECEMBER 1. A prudent farmer in this District makes a very proper distinction between laying up "wheat-riggs" where there are pheasants, and where there are none. In a part of his farm tolerably free from game, he lays it up in six-furrow work; but towards the covers, in wide flat beds; having found by experience that pheasants always begin to scrape on the sides of the furrows, where they can easily come at the grain; the mould being there loose, and easily falls back into the furrows: therefore, the

WHEAT.

GAME.

41.
 PLOWING
 for
 PHEASANTS.

the fewer inter-furrows the less mischief they are capable of doing: for while they scrape upon a flat surface, "they bury two grains by scraping up one;" besides its being a work of much greater labour to come at them.

He says he always "lays" to lose the two outside furrows or drills: if therefore he laid his land in six-furrow ridges, one-third of his crop must be inevitably lost, at seed-time; besides the depredations he is liable to, during the winter, and at the approach of harvest.

42.

HEDGES.

DECEMBER 6. The mal-treatment of hedges in this country is painful to look upon; and there appears to be only one way of preventing a Norfolk farmer from destroying them.

Unnecessary restrictions I confess are hateful; but to suffer unnecessary destruction of things so essential to an inclosed estate as are live hedges, would be equally unpardonable; and I am determined henceforward to stem, *if possible*, the vile practices, so prevalent in this country, of "outholling" and "cutting kid*:"

* "Outholling"—scouring out the ditch—provincially, the "holl"—for manure, without returning any part of the mould to the roots of the quick. — "Cutting kid"—knocking off the lower boughs of tall hedges; leaving wide.

A regulation of this kind will not be taking from the farmers the privilege of cutting kids for their "par-yards," nor of collecting mould for their yards and dunghills; but it will be obliging them, while they furnish themselves with these two necessary articles, to do justice to their fences.

Under this regulation the farmer will not calculate how few rods of ditching he can make shift with; but how many loads of mould and hundreds of kid he shall be in want of. Thus the interest of the tenant and that of the landlord will become intimately connected.

43.

DECEMBER 14. This autumn I met with a singular instance of *sowing wheat after turneps by two furrowing*. (See SOIL PROCESS.)

The first plow skimmed the surface, and threw it into the last-made trench; on this furrow the seed was sown, and covered with the bottom furrow brought up by the second plow; the

wide-spreading tops, to over-hang the young shoots, and smother the underling plants; rendering, of course, the bottom open and fenceless; whilst the roots of the surviving tree-like plants being left naked of mould, these in length of time dwindled away for want of a proper supply of nourishment. See art. HEDGES, vol. I.

seedsmen

42.

HEDGES.

SOWING
WHEAT.

43.
SOWING
WHEAT.

seedsmen always keeping between the plows, and sowing the seed by hand between the furrows.

The plits being taken off very thin, the two reached only a mean depth; so that no fresh soil was brought up.

Two plows and one seedsmen finished from an acre to five roods a day. The harrow was just run over to break the surface, and let the seedling plants freely out. The land is laid into warps, not into ridges.

This method is somewhat tedious; but the plants come up beautifully even, and the surface, of course, is free from rubbish.

The plants do not come up in drills, but promiscuously; occupying the whole surface. This the Norfolk farmers seem to think preferable to their standing in rows: and, no doubt, the soil in this case is the most uniformly occupied by the plants.

44.

MEADOWS.

DECEMBER 17. The "water-workers" in Norfolk have a very expeditious way of scouring-out old drains which are grown up with grass and silt.

They first mark out the edges of the drain with a sharp spade, or other instrument, cutting

ting through the depth of the mud. If the drain be wide, they make another cut along the middle, and then cross it, so as to separate the whole into large square pieces of three or four spits each.

The workman then takes a large hook, with three flat prongs, and a stout long wooden handle—provincially, a “mud-croom,”—and, standing by the side of the drain, draws out the “tuffucks;” placing them regularly on either side; and, lastly, with a sharp shovel, forms the bottom of the drain, and shovels out the loose mould.

44.
SCOURING
DRAINS.

45.

DECEMBER 18. In my ride this morning I observed two or three instances of young hedges which are ruined through the bank being set injudiciously on the upper side of the ditch.

HEDGES.

Ditches on hill sides should be made to face up-hill; especially where the sub-soil is springy. For if the springs work through, under the bank, they soon undermine and let down the face, together with the layer, into the ditch. The outside of the ditch shooting in is of much less consequence.

46.

REARING
CATTLE.

46.

1782. JANUARY 9. Observing, to a good husbandman, that his three-year-olds were rather small; he said, Yes, they are; adding, that his turneps were but indifferent last year; and that he was too eager after bullocks; but he now wished he had done better by his store beasts: for he always found that they paid best for "grazing:"—that is, for good keeping.

This was the observation of a sensible, elderly, judicious, capital farmer; and came immediately from experience.

47.

RENT-DAYS.

JANUARY 9. The times of the year for the receiving of rents should be regulated by the produce of the country, and the objects of the farmer's culture.—He ought not to be obliged to dispose of his produce to a disadvantage, nor sell it under the market-price. Nor ought he, after his money is received or due, to have too great indulgence; lest he may be tempted to speculations; which, in the end, might hurt both himself and his landlord.

In a corn-country, Christmas is of all others the most improper time for the farmer to pay his
his

his rent at: he has just time enough to do himself all the injury possible. Stimulated by an honest pride of carrying the whole balance; or fearful of the frowns of his landlord; he hurries out his corn, unmindful of the lowness of the price, or the waste he is committing on his "stover."

Were he called upon at Michaelmas, he could not commit this unpardonable waste: if at Lady-day, he could have no temptation to do it. Besides, at Christmas, tithe, tradesmen's bills, the land-tax, and other quarterly rates come upon him; and it is not the loss of the stover only, but the mealmen and maltsters, knowing his situation, take their advantages.

This year furnishes a striking instance of the impropriety of receiving at Christmas in Norfolk.

We have not yet had scarcely so much as a hoar frost, nor one flake of snow; cattle in many places are even yet abroad, at grass; yet the major part of the tenants of this neighbourhood have already thrashed out three-fourths of their corn. Many of their yards are several feet thick with straw, with scarcely any intermixture of teathe; and some of them without being so much as trodden.

47.
RENT-DAYS.

There is another evil consequence, in Norfolk, of receiving rents at Christmas : it is full as much as the *poor* farmer can do, with all his mischief, to raise money for his landlord : he dare not lay out a shilling on bullocks to feed off his turneps ; which he is of course obliged to sell at such a price as he can get, and have them eaten off when and in what manner best suits the purchaser ; whereas, had he time to thrash out his corn deliberately, he would find money to buy bullocks, and to pay his landlord.

Supposing the farmer to have paid his last shilling to his harvest-men (which God knows is at present the case with farmers in general) his only resource is consequently his crop. He first begins upon his wheat, in order to raise money for his servants wages, and the parish-rates, at Michaelmas. His seed-wheat must next be thrashed out, or purchased : a few bullocks is probably wanted ; and the next quarter's rates, tithe, and tradesmen's bills must be paid at Christmas. Thus without opening one sheaf for his landlord, he must do considerable injury to his sower. What then must be the consequence, if, in the same time, he thrash out in addition thereto more than his half-year's rent ?

How

How differently this matter would stand, were tenants indulged until the latter end of February or the beginning of March.

The business of the barn would then take its natural and regular course: the servants wages and Michaelmas rates being discharged, and the seed-wheat and some bullocks being provided, the farmer would, about the beginning or middle of December, get his stock into his yards, and begin in earnest upon his barley.

By Christmas he would find no difficulty in discharging his tithe, tradesmen's bills and parish-rates; and would have the two principal months for thrashing before him (besides perhaps a surplus in hand) to raise money for his landlord.

His rent being cleared up to Michaelmas, and his flails still being of course kept going, his Easter and Lady-day rates would be regularly paid; besides a sufficient overplus for the purchase of such clover or other seeds as might be wanted during the spring seed-time.

In April and May his bullocks travel to market; and, by the beginning of June, his purse begins again to overflow; but after this his receipts are trifling.

The beginning of June, therefore, is the time when he ought to pay to his landlord as

47.
RENT-DAYS

much money on account of the current year's rent as would leave him a sufficiency (with his dairy and other small receipts) to pay his Midsummer rates and get in his harvest.

The first of March and the first of June have one peculiar advantage as rent-days; not only in Norfolk, but in every other country; they do not interfere with quarter-days; and, in Norfolk particularly, they are leisure-times of the year.

48.

BUILDING.

JANUARY 10. It is economical to *lay tiles on mortar*, or ceil the room they cover; they are otherwise subject to every gust of wind; not from its action upon the outside, but from finding, when pent up on the inside, an easy passage through the covering.

An instance occurred the other day: a farmhouse had two or three yards square of tiling blown off by the late winds; not on the windward, but on the leeward side of the house; and from over the only room about it which is not ceiled.

49.

JANUARY 10. How strong and lasting is the current of custom! The Norfolk farmers, while

while corn sold high, were assiduous to cultivate every inch the plow could reach: old marl-pits were levelled: nooks and corners grubbed, and broken up: and even bogs were converted into arable land. Grassland, of course, became wholly out of fashion, and totally neglected: and now, when corn is low, the same practice still prevails: scraps of arable land are still purchased at more labour than they are sometimes worth; while the meadows are suffered to remain a disgrace to the country; notwithstanding they would pay trebly for improvement.

49.

GEN. MAN.
FARMERS.

50.

JANUARY 11. The other day, I observed in the practice of a superior husbandman the following method of *destroying ant hills*. With a common spade, ground somewhat sharp, he divided the hill into four quarters. With the same instrument he then pared off the sward of the quarters, an inch to two inches thick; leaving the triangular turves pared off fast at their bases, folding them back upon the adjoining sward. This done, he dug out the core of the hill; chopping and spreading the mould abroad; and leaving a hollow basin where

MEADOWS.

G 3

the

50.

ANT-HILLS.

the hill stood, in order to collect the winter's rains, and thereby effect a radical cure. Lastly, the folds of sward were returned as a cover to the excavation, leaving the surface grassy, nearly level, and scarcely discernible from the surrounding sward.

This operation is aptly called "gelding;" and, though not universal, is a most excellent practice.

Between Michaelmas and Christmas is the proper time for performing it; for then the excavated mould becomes tempered by the winter's rains and frosts; and the folds of sward have time to unite with the soil before the summer's drought set in.

51.

MEADOWS.

GEN. MAN.
FARMERS.

JANUARY 13. What a disgrace, and what a field for improvement, are the meadows of this county! The farmers hire marshes and grazing-grounds at the distance of twenty or thirty miles, and give high prices, when at the same time many farmers might, with a common share of attention and management, have them at a much cheaper rate within the limits of their own farms.

But

But custom and prejudice are doughty champions to deal with : whilst a Norfolk farmer is bestowing more “cost” upon his arable land than, at the present prices of corn, he can ever regain from it, he is “doing rarely well by his land;” but the moment the foot of improvement steps on to his grass-lands, be it even to open a few gripes to let off the surface-water, the eyes of the country are upon him; for he is “buying his meadows.” Were he to carry a load of muck from his par-yard on to his meadow-land, a statute of lunacy would be the probable consequence.

Prejudice, however, is not the only thing against the improvement of the Norfolk meadows. A want of knowledge in the art of draining is a sister-cause; for of the few who attempt to drain their meadows, scarcely any are acquainted with the method of performing it properly. They make their drains much too small, too numerous, and cut them in improper directions; nor do they ever go to a proper depth to do the work effectually; for should they chance to dip to a bed of gravel they have done wonders, and there they stop; for their spades and “mud-crooms” can go no farther.

51.

GEN. MAN.
OF FARMS.

MEADOWS.

51.

MEADOWS.

Nor is the method of *draining* the only part of the mismanagement of the Norfolk farmers in regard to their meadows,—they do not seem to be aware that *pressure* is a main improvement of boggy moory land. I have never seen nor heard of a roller being drawn over a meadow since I came into Norfolk!

There are, however, some few exceptions to this general mal-treatment of meadows to be met with.

The Rev. Mr. Horsley of Swayfield has drained his meadows in a capital style, and Mr. Samuel Barber of Stanninghall is manuring his with foot, &c. and clearing them from ant-hills, furze, alders, and other incumbrances.

ALDER.

This last is a great nuisance in meadows; an alder not only encumbers the spot it stands on, but is allowed on all hands to render moory soil still more rotten. It is a vile inhabitant of or in the neighbourhood of a meadow; for the seeds being blown about by the wind, they are trodden by cattle into the soil over the area of the meadow; where, springing up among the herbage, the young plants embitter the grass, and render it altogether impalatable to stock.

In improving meadows, the main object is to disengage the mould from collected moisture:

for

for while any part of the black moory peat-bog soil lies in contact with water, the whole will, like a sponge, be filled with moisture: and it is in vain to attempt to render the surface dry, while the bottom remains in water. Therefore, drains deeper than the bed of moor are essentially necessary.

Meadows have generally a rivulet running through them: this, although it may have worn itself down to the gravel, should nevertheless (as it in general may) be considerably deepened; enough to lower the *surface* of the water *below the moor*; and still enough more to allow for a descent in the drains to be laid into it.

The rivulet should be deepened (as should all "water-work" be performed) in autumn; when the soil is in its firmest state: not in the spring (as is the almost universal practice), when the moor is sopped with water, and the quicksands all alive.

The rivulet, or other common shore, being lowered; and the sand or gravel (if any) spread over the adjoining moor (or, if a bad mould, used to level the inequality), and the surface-water (if any) let off into the shore; the meadows ought to remain in this state until the ensuing autumn; by which time the lower margins,

51.

MEADOWS.

51.
MEADOWS.

gins, towards the main drain, will have acquired a degree of firmness, perhaps, sufficient to admit of the lateral drains being cut to their full depth.

Very rotten meadows, lying on a blowing oozy quick-sand, cannot however, with any propriety, be finished the next year : therefore, in these, the upper moory stratum alone should be raised ; laying it as far from the edge off the drains as the arm and spade can reach.

In the course of the ensuing summer the mould ought to be turned over to forward its digestion ; and to bury the weeds, which never fail to grow upon it in great abundance ; and which being turned under in the fulness of sap, are very beneficial in promoting the digestion of the whole mass.

In autumn the drains ought to be finished—the inequalities done away, and the manure spread over the surface ; *provided* this can be yet done with safety.

But should the quick-sand be still so strong as to endanger the sides of the drains, go no deeper the third year than can be done with safety ; deferring the finishing spit until another, or even another, summer has rendered the sub-soil firm, and the springs are effectually killed.

This

This is dividing the expence; doing the business effectually; and treading sure ground.

51.
MEADOWS.

The drains should not be cut, as is generally the case, perpendicular to the rivulet; but either parallel with it, or, if their mouths be laid into it, in an oblique direction; in order that they may act more effectually upon the subsoil; as well as to clear their mouths the better at the rivulet.

Nor should the open drains be too numerous: for by that means the roller and carriages are prevented from being turned between them.

Above all, the drains ought to be made of a sufficient size: their depth should be regulated by the depth of the moor and its substratum of quick sand, and consequently by the rivulet, which ought to follow the workman a considerable way up the new-made drains. Their width ought to be sufficient to deter stock from attempting to cross them; otherwise the sides are soon trodden in, and the stock endangered.

Nothing is more common than to hear of stock being smothered in the meadow-drains: last summer, a horse was smothered in a suite of meadows, which for a trifling expence might be made firm enough to bear any stock, and lay several weeks before he was found.

The

51.
MEADOWS.

The utility of large wide drains is obvious in a meadow adjoining to the suite abovementioned; a drain six or eight feet wide, and five or six deep, lays dry a meadow of eight or ten acres: a carriage might, even now, pass with safety by the side of it.

If the beds be made less than twenty yards wide there is not, as has been observed, room to turn a roller or waggon with safety upon them; if, therefore, the open drains, at that distance, be not sufficient to make beds of that width sufficiently dry and firm, under-drains should be laid into them.

If the beds be made wider than thirty yards, a carriage will be wanted to set about the mould, which rises out of the new-made drains, and which will afterwards arise from the parings of the sides, and the shovellings of the bottoms. But if they be made within that width, a man will be able to manure the whole without that additional expence; for if the mould be cast, in the first instance, as far as may be from the drains, and be afterwards, in turning it over, removed still farther from them, the farthest shovel-full will not require to be cast more than ten yards.

It is obvious that, in draining a meadow in this manner, the paltry gripes and water-furrow

furrow with which meadows in general abound, would become useless; and would require to be filled up with alders, other rubbish, and dead mould, dug out of the new drains. The surface mould however ought, as above intimated, to be reserved for a better purpose; namely, to be spread over the finished beds as a manure. Its effects on a meadow which last year I had frequent opportunities of observing, was striking; it appeared to kill the rushes and other aquatics; and brought up a thick matt of white clover, and other luxuriant grasses.

51.
MEADOWS.

52.

JANUARY 19. A singular instance of fat-ting swine now occurs in this neighbourhood. SWINE.

The other day, Mr. S. of C. had thirty or forty bacon-hogs at peas; put into long open troughs, in the middle of the yard. Now, he has fifty or sixty porkers at barley and oats.

The pigs look healthy and well, and, Mr. S. says, fat apace. He keeps the yard well-littered, and they have water to go to.

He sold fifty last week at the Hill at Norwich at nineteen shillings and sixpence, and fifty more this week at home at seventeen shillings.

52.
FATTING
SWINE.

lings. He bought them a few weeks ago at about half a guinea a head,

He shewed me one which he had killed for Walsham market: the meat was peculiarly delicate, and quite fat enough; it weighed four stone, valued at four shillings to four shillings and sixpence a stone.

Mr. S. says, he not only finds that they fat very fast; but that the drovers are particularly fond of pigs fatted in this manner; they travel better than sty-fed hogs; and do not shrink so much with their journey.

They are making him a valuable yard of dung, with very little attendance, and without the expence of house-room. There is a cart-shed in the yard, under which they may run in bad weather.

Mr. S. argues in favour of his plan, that pigs never do better than when they help themselves, as in stubbles, or at a barley-rick: give a pig acorns, he says, in a sty, and they are wasted upon him; but let him pick them up himself under the oak, and he will get fat.

Mr. S. mixes one bushel of oats to a coomb of barley; in order that the pigs may grind the barley, and thereby prevent its passing through them

them whole. It has the desired and, indeed, a striking effect.—Mr. S. broke several parcels of dung, but not the trace of a whole grain of barley in the yard. The oats not being a favourite food, prevent the pigs from eating the barley too greedily; as well as being husky, they require a longer time to be chewed. Mr. S. treats buck in the same manner, with the same effect: peas I find are not unfrequently put among buck for the same purpose.

This is to me a new idea. Mixing chaff with oats for horses, to promote the mastication of the latter, is an old, and now almost universal, custom; and mixing different sorts of food for hogs, in order to obtain the same valuable effect, is self-evidently judicious.

53.

JANUARY 24. Mr. S. of W. a steady money-getting farmer, rears his calves in this manner. (See REARING CATTLE, Vol. I.)

He begins about Michaelmas, and continues till about Candlemas.

Their food is skim-milk with a little wheat-flour. They have also chopped turneps in a trough and hay in a rack.

As soon as they learn to eat turneps freely, the pail is entirely left off; the turneps afford-
ing

52.

FATTING
SWINE.REARING
CALVES.

53.
REARING
CALVES.

ing them both meat and drink; these with a little hay being their only sustenance. Some farmers give them oats and bran; but Mr. S. esteems them dear feeding.

The time of their taking to turneps is uncertain: where there are older calves that have learnt to eat turneps plentifully, the young ones readily learn, by picking up the crumbs made by the old ones*.

About March, the first-reared are turned out among the fattening bullocks, in the day-time, and in a few days, if the weather permit, are turned out altogether.

During summer they are kept in the clovers, or at other high keep; and by next autumn are stout enough to stand the par-yard. This is esteemed a main advantage of rearing calves early in the season; for those reared late in the spring want two years nursing.

The price of calves, about ten days old, is eight or ten shillings; and of buds or yearlings, from twenty to thirty shillings; so that twenty shillings is an out-side produce of a reared calf; fifteen shillings, perhaps, is nearer the par.

* Breaking the turneps with a mallet has been found to induce calves to take to them sooner than when they are cut with a sharp-edged tool. Perhaps, pounding them, and mixing the pulp with milk, would be still better.

This

This cannot be adequate to twelve months extraordinary care, expence, and hazard; especially to a large farmer, who has, *at present*, more material objects to attend to.

Mr. B. of the same place, convinced of this, rears no calves: he finds that he can *at present* buy young home-breds and Scots cheaper than he can rear his own stock. But Mr. B. is a good judge of stock. For a small farmer, or for any one not thoroughly conversant in the business of buying and selling, it may be more prudent, and certain, to bring up his own calves: for, having learned from experience, how much stock his farm will carry, he goes on mechanically; so many cows—so many three-year-olds—an equal number of two-year-olds—and the same number of buds—with every year nearly the same quantity of turneps and clover to feed and fat them on. If his turneps prove under par, he sells part of his three-year-olds; if above, sells part of his turneps; and this seems to be the *natural basis* of the Norfolk husbandry.

53.

GEN. MAN.
OF CATTLE.

54.

54.

FENS.

JANUARY 24. The following is an accurate account of the *peat-grounds* of the fens.

The "turf-man" pays for rent	£. 0	4	0
For cutting from 1s. 6d. to 2s.	0	1	9
For "chimneying" (that is, piling them lattice-wise to dry)	0	0	6
For boating to the staith 6d. to 1s.	0	0	9
	£. 0	7	0

Profit and hazard (great quantities are sometimes swept away by the floods) 0 1 6

The felling price per thousand £. 0 8 6

The peats, when cut, are about four inches square (but dry to about three inches and a quarter); and from two to three feet long, or of a length equal to the depth of the moor;—every foot of which, therefore, affords nine peats: each yard 81: each rod 2,450 $\frac{1}{2}$: and each acre 392,040: which, at 4s. per thousand amounts to the sum of £.78 8s. 2d. an acre: besides the additional advantage of having uncovered a stratum of earth, which, in many parts, produces reed, spontaneously; and on which, it is highly probable, that valuable aquatic might on every part be propagated.

JANUARY

55.

55.

JANUARY 25. The farmers of Woodbastwick, in the southern part of this District, have their marl chiefly from Norwich in boats round by Yarmouth, forty or fifty miles. Sometimes they bring it by way of back-carriage from Thorp-next-Norwich, about six miles; at other times from Horstead, and other neighbouring pits, convenient for back-carriage: none within five or six miles.

MARL.

The usual quantity set on is eight or ten middling loads an acre. At Norwich they pay one shilling—at Horstead eighteen pence a load, uncalled.

The carriage (as back-carriage) is reckoned worth about three shillings or three shillings and sixpence; so that it costs them about four to five shillings a load; or fifty shillings to three pound an acre.

The marl brought by the wherries is worth at the staith about four shillings the middling load.

56.

JANUARY 25. Mr ——— of Woodbastwick has eleven large Scotch bullocks (from fifty to

FATTING
CATTLE.

H 2

seventy

56.

BULLOCKS
IN YARDS.

seventy stone) at *turneps in the yard*. They eat nearly two load a day—six would eat about a load.—They are given to them whole (except the tails, which are cut off in the field) with their tops on; in double bins; with straw scattered about the yard; serving them both as fodder and litter.

These bullocks cost the latter end of October one with another about 7*l.* 10*s.* ahead. Suppose they weigh by the latter end of April sixty stone on a par, and sell for four shillings a stone; the produce, deducting the expence of sale, will be about 4*l.*—at 4*s.* 6*d.* a stone, 5*l.* 10*s.*—at 5*s.* a stone, 7*l.*

If six bullocks eat a load of turneps a day, one bullock would eat thirty loads in six months. Twenty loads an acre is esteemed a fair crop. Therefore, at four shillings a stone, these bullocks will pay 2*l.* 13*s.* 4*d.* an acre; at 4*s.* 6*d.* a stone, 3*l.* 13*s.* 4*d.*; and at 5*s.* a stone, 4*l.* 13*s.* 4*d.* an acre for the turneps, straw, and attendance:—supposing them to take six months at turneps to bring them to sixty stone a head; which, I apprehend, is near the truth.

57.

FATTING
CATTLE
ABROAD.

JANUARY 25.—Mr. Samuel Barber, whose accuracy may be depended on, says, that twelve acres

acres of turneps upon his Stanninghall farm, have carried thirty-five fatting bullocks, followed by forty-five cows, highlanders, and other lean stock, together with fourscore fatting sheep, five weeks and three days; that is, reckoning eight sheep to one bullock, forty-five fatting, and forty-five lean bullocks; from forty to fifty stone each.

57.
BULLOCKS.
ABROAD.

In six months these bullocks would not eat, at this rate, quite sixty acres: but the turneps are very "thight" and very good.

Mr. Barber attributes the good proof of his turneps this year on his Stanninghall farm chiefly to their "thightness." He says he never minds how close the hoers leave the plants, so that they draw their hoers between them. He says he has suffered some pounds this year, on his Bastwick farm, through the hoers, in his absence, being suffered to hack them out too thin*.

TURNEPS.

The same judicious husbandman says, he treats his Stanninghall farm (a light dry soil) for turneps, and for olland barley, in this manner: the first plowings, whether they be two or three,

SOIL-
PROCESS.

* Mr. Baker of Southreps, whose opinion in this case is equally valuable, holds out the same ideas; saying, that he is always attentive to his hoers, to see that they do not set out the plants too thin.

57.

SOIL-PRO-
CESS.

he gives very fleet, and fetches the soil up the last plowing a full pitch; by which means he sows his seed amongst a mould which has never been exposed to the drought; and, consequently, contains a degree of moisture very favourable to the seedling plants.

TURNEPS.

To this management he attributes, in some measure, his great success in turneps this year. They are indeed the best in the country, and on a soil whereon turneps have not grown, with any degree of success, for many years.

BARLEY.

For olland barley, he endeavours to break the flag as little as possible, so that the grass be killed: he therefore would chuse not to break up his olland till after Christmas. With this process he sows the barley above-furrow.

58.

FARMERS.

JANUARY 29. In a conversation, to-day, with two of the first farmers in the county, a comparison between the present times and those of fifteen to twenty years ago, became the subject.

The price of barley was, then, from five shillings to seven shillings a coomb; of wheat, from ten shillings to fourteen shillings; and beef three shillings and sixpence a stone. Now,
barley

barley is eight shillings, wheat twenty-two shillings, and beef four shillings to four shillings and sixpence; yet, in those days, farmers had plenty of money, and actually increased in riches; whereas, now, they are moneyless, and are every year sinking in poverty.

58.
FARMERS.

To explain this paradox seemed difficult: the price of day-labour is somewhat decreased; servants wages the same, now, as then; house-keeping somewhat more expensive, as to the price of its particular articles; but, upon the whole, it is not more so; for farmers, principal farmers, now keep less company than they did in those times. One of them observed, that he pays the same price for a coat, and the same for a shirt, he did formerly; and as to market and other personal expences, he is clear that among capital farmers they are less now than they were then. The poor's rate, it is true, falls heavy at present; but he says that he pays only fourteen pounds now for what he then paid ten pounds: this therefore is not of material consequence; and this excellent husbandman, sensible and well-informed as he is, seemed willing to assign the cause to some inexplicable hidden mystery.

58.

FARMERS.

At length, however, he produced an idea which goes a great way towards explaining the *apparent riches* of former, and the *apparent poverty* of the present, times.

In every corner there are moneyed men : formerly they diffused their riches through the neighbourhood they lived in :—it was no uncommon circumstance for a farmer even to be asked to take money ; whereas, now, through a want of private credit and moneyed faith between man and man, and still more through the present high rate of interest to be made on government security, the monies which were dispersed in the country among farmers and tradesmen are now all called in.

This explains very fully the *apparent riches* of former times and the *apparent poverty* of the present : but it does not explain why farmers formerly grew rich, but now grow poor.

RENTS.

The late rise of rents at once fully developed the whole mystery. For although the usurer's money might assist the farmer in purchasing stock, &c. to an advantage ; yet this advantage was in great measure cancelled by the interest which he had annually to pay for it ; whereas the money arising from the comparative lowness of rent required neither interest nor even principal to be repaid.

Thus,

Thus, supposing farms to be raised thirty per cent. within the last fifteen or twenty years; and supposing that, among middling farmers, the rise in the poor's rates, and the extra expence of house-keeping, is adequate to the advance of produce; the farmer who now just makes ends meet on a farm of one hundred and thirty pounds a year, had formerly a surplus of thirty pounds left in his pocket to buy stock, &c. at the best market*.

This, even the second year of his lease, he found of great advantage; but the third year, the thirty became sixty; the fourth, ninety, or perhaps one hundred pounds; for the interest, or a proper management of the money, had increased his stock; so that by interest upon interest, or by other advantages made of the money, a careful, industrious, *fortunate* man found himself, at the end of his twenty-one years lease, to be worth eight hundred or one thousand pounds; and consequently got, very deservedly, the name of being a rich farmer.

* A striking instance of the loss arising from a want of loose money to buy stock when the markets are low, occurs this year: at Kipping and Kenninghall sheep-shows (a few months ago) the same lambs might have been bought for five shillings and sixpence, which are now worth half-a-guinea a head.

But

58.

RISE OF
RENTS.

58.
RISE OF
RENTS.

But the case of the man who now takes a farm of a hundred and thirty pounds a year, is very different.

Let us suppose him to have a capital just sufficient to stock it, and help him through the extra expences of the first year.

His crops turn out tolerably, and having common good luck with live stock, the neat produce of his farm just clears its expences, buys him a new coat, and pays his landlord: but this done, he finds himself without a sixpence left in his pocket for manure, or to go to a cheap market with.

This however is not all. In the course of the year, he loses a cow, perhaps a horse. What is to be done? He is penniless, and cannot borrow a shilling in the whole country. Why, he must either do without, to the great prejudice of his farm, or sell some other part of his stock to replace them with.

The next year his wheat or his turnep-crop fails him. He has not a shilling before-hand to carry him over the difficulty; he consequently becomes in arrear with his landlord; his spirits are broken; his land not only wants manure, but even labour and teathe; for he is glad to sell his bullocks before Christmas to keep

keep his landlord in temper :—the consequence need not be traced,

58.

Thus it appears that the poverty of present farmers, more particularly of middling and small farmers, results in some measure from an advance in the expences of house-keeping and an advance in the parish-rates; but principally from the present scarcity of money, and from the late rise of rents.

FARMERS.

59.

FEBRUARY 5. In sinking a well near Gunton-House, the workmen it seems traced the tap-root of an oak, through an uniformly white sand, to the depth, I think, of twenty feet. The tree was nevertheless uncommonly healthy and beautiful.

THE OAK.

This shews that a strong soil is not necessary to the production of fine oaks.

There might, however, be one circumstance favourable to this oak. The stratum which it grew in might be impregnated with the drainage of the house and offices; for of so absorbent a nature is this bottomless bed of sand, that it drinks up the whole drip of the house, together with the overflowings, and waste water, and silt of every denomination.

SUBSOIL.

Nor.

59.
SUBSOIL.

Nor is this a singular instance of the absorbency of the Norfolk soil; for of a similar nature is the most frequent subsoil of the county: dig a marl-pit through to the sand, the water immediately vanishes.

60.

REPAIRS.

FEBRUARY 5. *Buttresses*, to stay-up old buildings, are very awkward, very expensive, and very subject to decay, if not well secured from the drip of the building they support: yet, if walls lose their upright, something is necessary.

Buttresses, however, may frequently be avoided, by thickening the foundation, and forming an arch-like foot or underpinning to the whole part affected.—Witness a tall fence-wall at Northreps; and a dwelling-house at Bradfield; where a buttress, in the front of a good house, would have been very unsightly.

The *spring* or width at the base, as also the height, should be in proportion to the degree and height of the bulge to be secured.

Where the whole wall has given way and overhangs much, a tall buttress may be necessary; though even in this case, supporting the beams and rebuilding the wall from the foundation

foundation is generally more prudent:—a large buttress swallows up a great quantity of brick and mortar; and, when raised, is but a temporary relief.

A large blue slate forms an admirable *roof* for a buttress:—an instance occurs upon Antingham-hall farm.

60.

BUTTRESSES.

61.

FEBRUARY 5. A neighbouring farmer having one side of a close of turneps which he could not get off fast enough to be sown with wheat, he cut off their tops with a spade, gave the tops to his cows, carted the bottoms into a new-made adjoining ditch, (backing the cart and tipping them in) and covered them over with a little straw; and, over this, with bramble-kids, to keep the stock from them.

PRESERVING
TURNEPS.

Here they lay until wanted in a frost, when the cart was again backed to the ditch, and the turneps loaded with a fork.

He says, that his beasts eat them as well or better than fresh-drawn turneps; and that in general they came out as sound as when they went in. Had the tops been deposited with the roots, they would probably have brought

61.
PRESERVING
TURNEPS.

brought on a fermentation, and have spoiled the whole deposit.

Might not this practice be extended to the preservation of turneps in the spring?

Turneps, this year, began to run the beginning of January: they have now, in general, got spring shoots five or six inches long; and, if the present open weather continue, the roots must be considerably exhausted, and the land very much drawn, long before bullocks in general are finished, or grass begins to grow. But if they were now (when labour is cheap and plentiful) topped and carted into dry ditches, or formed into stacks with straw*, their goodness might be preserved, and the land be got into forwardness for barley.

If they were stacked in or near the yard, there would not, for shed or straw-yard bullocks, be any labour lost.

Whether, after this remarkably mild winter, the spring prove very mild, or very severe, they would, by this means, be removed out of harm's way.

62.

THE ASH.

FEBRUARY 7. There is, in a grove at Gunton, a large ash, (at least a load of timber in

* Perhaps hurdles, set chequer-wise, would be found convenient receptacles.

it)

it) which is *disbarked* entirely round the stem, about a foot from the ground. On one side the upper and lower barks are separated about a foot from each other; on the other side not more than three or four inches: they seem to be drawing towards each other, and may in a few years unite.

62.

THE ASH.

This tree was probably *disbarked* by deer, from five to ten years ago; yet it is not only alive, but apparently as growing and healthy as any tree in the grove.

VEGETABLE
ECONOMY.

63.

FEBRUARY 7. I have frequently observed that the face of a ditch over which *ivy* has spread itself, stands invariably.

HEDGES.

Perhaps, on a sandy soil, where the face of the bank is perpetually running down like an hour-glass, plant or sow a drill of *ivy* near the feet of new-made ditches.

64.

FEBRUARY 7. The roof out of repair, the whole fabric is in danger.—Not only the spars, but the “*plansher*,” nay, even the ground-

REPAIRS.

64.
REPAIRS.

ground-floor, I have seen rotten through a bad roof.

Perhaps send a thatcher and bricklayer round to each farm annually: if nothing be wanted upon it, there may no doubt be half a day's-labour lost; but if there is, a few shillings laid out in time may, in a course of years, produce a considerable saving.

If the landlord take care of the roofs and foundations—the tenants will, for their own conveniency, be ready enough to remind him of the repairs wanted on the inside.

65.

MEADOWS.

FEBRUARY 7. A striking instance of the shantiful management of meadowland in Norfolk occurs upon the church-farm at ———.

The late tenant was afraid to trust his stock in one of his meadows: he has lost several cattle and horses in it—the skeleton of a horse now lies there.

The present tenant could not get his stock into it, until, at a considerable expence of heath and sand, he made a gangway.—To him (who has taken it for only one year certain) I could not value it at more than five shillings an acre: yet I will venture to say, that for the
trifling

trifling expence of twenty shillings an acre, properly laid out in the course of next summer, it would, in two or three years time, be worth from twelve to fifteen shillings an acre.

I will give an estimate of the expence, to shew the *real* improvement which the meadow-lands of Norfolk are capable of.

This meadow is a parallelogram lying on a flat, and contains five acres, two roods, seven perches.

A rivulet runs on one side of it, upon a bed of gravel, and five or six feet below the surface of the meadow. Across the meadow, perpendicular to the rivulet, are two drains, grown up with haffocks, and trod in by cattle; and round it is a watery ditch, also full of grass and mud.

There are about eighty statute rods of ditching, and about forty statute rods of draining.— The ditches might be scoured for 2 shilling, the drains be opened for sixpence, the long rod.

80 statute is about sixty-three long

rods, at 1s. - - - 3 3 0

40 ditto, about thirty-one, at 6d. 0 15 6

£ 3 18 6

But the drains could not be opened level with the rivulet for that money; nor could

65.
MEADOWS.

they, for that, be made fences: for one shilling a rod they might, I apprehend, be done effectually, which is an addition of - 0 15 6

£ 4 14 0

Nor could the ditches, perhaps, be carried round level with the rivulet (which they ought to be, the workmen leading a dead water all round) for one shilling a rod: for fourteen-pence I believe they might: this is a further addition of - - - - - 0 10 6

£ 5 4 6

Besides this three trunks, or arches, would be wanted as an entrance, and for communications between the beds; the stuff, too, would require to be set about: these, however, come under the idea of annual and ordinary expences; we may therefore say, that for the inconsiderable purchase of five guineas an improvement worth fifty or sixty pounds might be obtained.

Perhaps when a meadow is so situated that the rivulet cannot be sunk below the moor, lay the main drains into wells, dug at a convenient distance from the rivulet, and pump the *remaining* water into it. One length of tree would do, and a man would pump out a great quantity of water in a day; and what are a few days works

works compared with the difference between a drained and an undrained meadow?

Perhaps a stubborn quicksand might be overcome by digging a well near it.

65.

DRAINING
QUICKSAND.

66.

FEBRUARY 8. It is an excellent custom of the Norfolk farmer to erect *rubbing-posts* in the different parts of the inclosure he is feeding or teathing; they keep the stock from the fences, and furnish them no doubt with an agreeable, and perhaps a salutary, amusement.

CATTLE.

Some I see draw the crown of a tree, with the lower part of the boughs left on, into the middle of the close: this is less trouble than putting down a post, is easily rolled out of the way of the plow, and seems to be still more agreeable to the cattle.

RUBBING-
POSTS.

67.

FEBRUARY 9. Mr. Arthur Bayfield (whose good sense and judicious management have repeatedly engaged my attention) sows the principal part of his wheat in four-furrow work, with this peculiarity:—He sows only half the seed before the plows. (See WHEAT, Vol. I.)

SOWING
WHEAT.

The first plowman sets out a very wide “back”; so that the tops of the first two fur-

67.

SOWING
WHEAT.

rows do but barely touch each other. The seedsmen follows, and sows the remaining half of the seed in the trenches made by the first plow.—Another plowman follows, and, with a neat narrow furrow, covers the seed and makes up the ridges.

It was on my observing to him, the other day, the evenness with which his wheat comes up, that he told me his method of putting in the seed.

Farmers in general he thinks sow too much of their seed on the warps, by which means the tops of the ridges have more than their proportion of seed; unless the ridges be made very narrow, which occasions a loss of labour.

Mr. B.'s four-furrow work is nearly as wide as the six-furrow ridges of some farmers; and it is impossible for wheat to come up more beautifully than his does this year.

68.

TURNEPS.

FEBRUARY 9. Last year, there were turneps sold as high as 5*l.* an acre; a price seldom, if ever, before known in Norfolk. At the beginning of this season, four pounds ten shillings, some say four guineas and a half, an acre was

refused for turneps—The same turneps are now worth about three pounds.—Good turneps are sold for fifty shillings, tolerable ones for forty shillings.

68.
PRICE OF
TURNEPS.

The reason for this rapid fall of turneps is twofold: the openness of the winter, and the scarcity of bullocks, this year; owing to their high price at Michaelmas, and to the poverty of the farmers.

A. gives forty shillings for tolerable ones, and is allowed to bring some home; but he pulls and tends the rest himself (*A.* says pulling and straw is worth twenty shillings).

B. took in lean three-year-olds at two shillings a week, but their owner would not continue: *B.* therefore sold him the turneps at fifty shillings an acre (middling); *B.* to pull and tend; but the purchaser to find straw (*B.* reckons pulling, &c. worth ten shillings an acre.)

C. agreed (early in the season) with *P.* at three pounds; *P.* to pull, tend, and find straw; which *C.* reckons at fifteen shillings, viz. five shillings the straw, and ten shillings the attendance.

69.

BULLOCKS
AT
TURNEPS.

69.

FEBRUARY 9. It is a general observation, that in this remarkably warm open winter, shed-bullocks have done very badly; while bullocks abroad have done extremely well.—A person who is a competent judge in this matter instances some bullocks, which he saw the other day, that have scarcely got any thing during several weeks they have been at turneps:—his remark was, that they sweat out as much as they lay on; that their coats are continually wet; their backs being covered with drops of sweat.

In cold winters, bullocks are observed to do best in sheds; but they do not travel so well to market as bullocks fatted abroad or in the open yard.

This being an interesting subject, and of great importance to this and every other light land District, I have collected the particular practice of such individuals as business, or other circumstance, has thrown in my way.

Mr. Barber, at Bastwick, (a somewhat tender soil) gives his bullocks turneps in bins in the open yard. At Stanninghall, (a dry firm soil) he keeps them wholly abroad, shifting them every day, or every two or three days, giving them straw in a moveable four-wheeled straw-rack.

Mr.

Mr. Thomas Seago, of Hanworth, throws the beginning of the season, and afterwards chops the turneps, and gives them in bins in the straw-yard.

Mr. John Hylton, of Felmingham, fats them abroad.

Mr. Arthur Bayfield, of Antingham—Abroad in the day; and, if near home, puts them into the straw-yard at night; but rather than drive them any distance, backward and forward, keeps them abroad altogether, with very little straw. Says, that his land being light requires to be trodden. Thinks that bullocks kept wholly in the yard should have their turneps in covered bins,—a kind of double narrow shed across the yard; for in case of frost and snowy weather, the turneps given them over-night, in open bins, are frequently left untouched, and are obliged to be taken out, and replaced with fresh ones, the next morning.

Mr. Robins Cook, of Felmingham—Abroad in the day; in the straw-yard at night; no turneps in the yard, nor straw in the field.—Says, they eat the straw greedily on their coming into the yard in the evening:—used to give them straw upon the headlands; not scat-

69.

BULLOCKS
AT
TURNEPS.

69.
BULLOCKS
AT
TURNEPS.

tered about thin, but all in one place, so as to be able to make a little manure; but this was only because he had not a spare yard to "stow" them in.

At Albro' (a more tender soil) he used generally to graze half a dozen bullocks in the house: he attended them himself, chopping all their turneps. They eat, he says, (contrary to common opinion) as many turneps in the house as they do abroad: six of them more than a load a day. Four o'clock in the afternoon, he says, is their principal hour of eating:—used to rack them up with the tops; the offal thrown to the buds.

Mrs. Swan, of Suffield, fats them abroad.

Mr. Forfter, of Bradfield—Abroad; with straw scattered under the hedges.

Mr. Jonathan Bond, of Waltham—Fourteen abroad.

Mr. Henry Helsden, of Antingham, fats them at *two years old*:—has no meadows, and cannot keep them till three years old. Has them always at "high keep:" being from the time they are dropt either at turneps, clover, or in the stubbles:—fats them abroad.

Mr. James Helsden, of Suffield—Sixteen abroad.

Mr.

Mr. F. LeNeve, of Bradfield, has ten abroad, and two cows "by the head."—Why keep the cows in the house and the rest abroad? "Because the cows are backwarder than the other, and I shall be able to bring them forward by good tending in the shed."

Mr. John Joy, of Walsingham, has five Scots; one four-year-old home-bred; eight three-year-old ditto; one two-year-old ditto; and two cows with their calves by their sides.

The four-year-old home-bred is a beautiful bullock, and very forward:—the three-year-olds, being more given to growing, do not fat so fast. Mr. Joy is clearly of opinion, that a four-year-old home-bred will beat any Scot.

The cows and calves are quite new to me; though Mr. Joy says, that "running calves" are, and have been, very common things in this country. They are sent up to London with the cows, and have been known to fetch as high as six or seven pounds a piece*. The cows are very old; yet notwithstanding the calves draw

* I was afterwards told that a gentleman near Norwich sold a year-and-half-old calf for ten pounds! It was offered to the butcher at nine pounds, or at five shillings a stone: he accepted the latter. On weighing it, the four quarters weighed forty stone! But it seems to be well understood that "running calves weigh like lead."

them,

69.

BULLOCKS
AT
TURNEPS.

BREED OF
CATTLE.

RUNNING
CALVES.

69.

RUNNING
CALVES.

them, the wonderful effect of turneps is such that they are getting fat apace: one of the calves (a heifer) is as sleek as a mole; and has already dropt a dug of considerable size: the other is not so forward; its mother being very old, and gives little milk. The calves eat turneps as freely as the rest of the cattle. What an admirable end is this for old cows!

REARING
CATTLE.

Some of the three-year-olds, and the two-year-old, are spayed heifers; but, through the negligence of the cutter, some of them have not been clean spayed, and are frequently running to bull; a circumstance which is of great hindrance to their fattening.

BULLOCKS
AT
TURNEPS.

Mr. Joy keeps his bullocks entirely abroad; giving them straw scattered over the close; or, in hard weather, under the hedges: he never puts them into the yard at night; thinking that driving them backward and forward is prejudicial to their fattening.

FATTING
CATTLE.

Mr. Jonathan Bond, of South-Reps, has eight *two-year-olds* at turneps; generally grazing *two-year-olds*: this year they are rather backward; but expects they will reach about thirty stone a piece with about six weeks grass. *Two-year-olds* he allows do not finish so early as the *three-year-olds*; but, if they be kept well from the
time

time they are dropt, they pay very well. It is observable that the heifers are not only forwarder but larger than the steers, though dropt at the same time: they are open, and had the bull about Christmas.

Mr. William Mann, of Bradfield, has six *two-year-olds* at turneps; they are doing very well; and, with a little grafs, will be very good meat. They were early calves (between Michaelmas and Christmas) and have a mixture of the Suffolk breed in them. One of them (*a dun, but borned*) will weigh upwards of forty stone: this is one instance in favour of the Suffolk breed.

Mr. Baker of South-Reps keeps his beautiful heifers bought at St. Faith's (See MIN. 27.) entirely abroad; giving straw under the hedges; and shifting them every day: they have thus far done well indeed.

70.

FEBRUARY 9. In riding over the estate, I have also made a point of collecting information respecting the rearing of calves, a subject of considerable importance in every county.

Mr. Barber rears none: he fats his calves, and kills them for the Pad-market at Norwich. (See CATTLE, Vol. I.)

Mr. Thomas Shepherd, of North-Reps, rears none: but shrewdly observes, that he cares not
how

69.

FATTING
CATTLE.BREED OF
CATTLE.BULLOCKS
AT
TURNEPS.REARING
CALVES.

70.
REARING
CALVES.

how many his neighbours rear. Mr. S. (as well as Mr. B.) is a judge of stock, and a frequenter of fairs and markets; and finds, no doubt, he can buy young stock cheaper than he can rear them.

Mr. —, of —, gives milk once a day (look but indifferently) with turnep-tops and oats and bran mixed together in a trough, and hay in a rack (the hay bad):—begins about Christmas.—Says, that one early calf is worth two backward ones; and instances it from last year's experience.

Mr. William Barnard—Milk twice a day with bran only (look well):—gives neither turneps nor tops, till they are a month or five weeks old.

Mr. John Hylton rears twelve to fifteen (he has a marsh)—reared three this season in August; they are now almost as large as yearlings. These had milk four months; in common he gives milk twice a day, with turnep-tops, for two months; and once a day for as much longer as he has milk: if milk be scarce, he makes milk-porridge.

Mr. William Sewell rears eight or nine.—Says, that he has had calves get quite fat on turneps and hay, when he has had bullocks in the yard; and the calves have been, of course, well tended;

tended : much, he says, depends upon attendance.

70.

REARING
CALVES.

Mr. Robins Cook rears about twelve ; keeps them at the teat twice a day, till three or four weeks old ; and once a day, till three or four weeks older : then offers them the pail ; but, if they refuse, or are difficult to learn to drink at that age, he leaves them to take their chance at turneps, hay, and water.

Generally loses three or four a year in the gargut*.

Mr. Arthur Bayfield rears twelve to fifteen ; used to rear eighteen or twenty.—Takes them off the cow at a fortnight or three weeks old : finds no difficulty in learning them to drink at that age :—keeps them at milk twice a day, until ten or twelve weeks old ; with turneps, turnep-tops and hay ; but no bran, &c. Cuts the turnep-tops, to prevent their being littered about.

Mr. Jonathan Bond, of North-Walsham, keeps eight cows ; rears ten calves : buys them chiefly of the drovers :—drove calves very dear this year ; from twelve to fifteen

* “Gargut,” or “murrain,” taken suddenly : a sort of mortification between the skin and the flesh : the skin upon the part is said to be “as hard and harsh as the crackling of roast pork.”

shillings

70.
REARING
CALVES.

shillings at a fortnight old. Gives them turneps, hay, and about three pints of milk, once a day. Says, that too much milk makes them neglect the turneps; but keep them short of milk, and they soon take to them: turns them to grass about the middle of April; by which time he reckons they cost him about twenty shillings a head; and says, that a bud of a year old may be bought for twenty-five shillings. But he adds, that bringing them up within himself, he does not miss the charge of them.

Generally loses two or three every year by the gargut.

GEN. MAN.
OF
CATTLE.

Mr. James Helsden, of Suffield—Eight cows: rears about ten calves; fats sixteen to twenty bullocks (his farm of the middle size): gives his calves hay, turneps, and milk twice a day, while young; after ten weeks or three months, once a day: begins about the middle of March to put his oldest out into a piece of turneps, three or four hours in the middle of the day, to play about and eat the turnep-tops.

Mr. ——— keeps eight cows; usually rears eight calves; but turneps being scarce, he rears none this year, meaning to buy eight or ten buds at the sales.

Mr.

Mr. John Waller brings up six: takes them off at two or three days or a week old: milk twice a day as long as he can give it; and then once a day as long as he has it; gives also hay, turneps, and bran; but no oats.

Mr. John Joy takes them off at about a fortnight old: milk twice a day for about a month, and once a day for a month or six weeks longer; until they can be turned out in the spring into a pightle of turneps: also gives them turneps, hay, and barley-straw, which, by way of a change, they eat as well as hay. Mr. Joy generally loses some every year in the gargut. He says, as soon as they are dead there is a jelly formed between the skin and the flesh: they are taken suddenly, and die presently after being taken: some bleed and rowel them with "gargut-root" (*belleborus fetidus*) in their tail or dewlap; seldom recover.

Mr.——, of South-Reps, begins between Michaelmas and Christmas.—Takes them from the cow about three weeks or a month old, and endeavours to make them "lusty;"—gives them about half a pint of milk once a day, with hay, oats, and bran; *but no turneps*. I asked him why? He gave me for answer, that his father, mother, himself, nor any of the family, had

70.

REARING
CALVES.

GARGUT.

70.

FATTING
CATTLE.

had ever given their calves turneps:—he added however, that oats and bran are heartier food; and that the milk is enough for them without turneps: his calves, no doubt, look well, and so do his buds and two-year-olds. Asked him if he did not find oats and bran expensive. He said, that the six which he has now, have eaten about three bushels of oats, and two bushels of bran, in about six weeks; which time they have been from the cows; they being now about ten weeks old. This is no great expence; not being above three-pence a head a week (*if be be accurate*). He speaks in raptures of oats for calves. He keeps them at milk until the turneps are gone; when he begins to make cheesc.

Mr. William Mann, of Bradfield, has already eleven this year: begins between Michaelmas and Christmas: lets them suck ten days: milk twice a day for a month or five weeks afterwards; and once a day until they do well upon hay and turneps; or until he can turn them out a few hours in the day into a turnep-close: Thinks that the milk is of little use to them, after they begin to eat turneps well: gives them the turneps whole; only tailing them; and freeing them a little from dirt: gives no

oats

oats nor bran: he is remarkable for fine young stock: he is very assiduous in keeping his calves well-littered.

70.
REARING
CALVES.

Mr. Henry Helsden, of Antingham, begins before Christmas: takes them off at a fortnight old; sometimes at three weeks; by which time they get "rarely strong", but do not take to the pail so well: gives them new milk twice a day for about a fortnight; and skimmed twice a day for a fortnight longer; and about three pints or two quarts once a day afterward; until the weather be warm enough to turn them out entirely to turneps: gives them the turneps in the house, whole, thrown upon the litter: learns them by cutting off the crown, breaking up the surface, and pouring milk into the inequalities. If hay be scarce or bad, gives a few oats and bran: look very well.

71.

FEBRUARY 16. Young Swann, of Suffield; had, the winter before this, some of the best turneps in the country. Seeing him; last summer, sowing some in what appeared to me a slovenly manner, the surface being covered with chick-weed, groundsel, charlock, and other rubbish pulled up by the harrows, I asked him

SOWING
TURNEPS.

71.

SOWING
TURNEPS.

why he did not give his land another earth before he sowed it. He answered, that the land was not foul; and that he, purposely, let the seed-weeds get to a head: having found, from the experience of two or three years back, that his turneps succeeded best when the seed was sown in that manner: saying, that he believed the "wreck" shaded the young plants, and kept the fly from them. I asked him if the rubbish was not in the way of the hoe: he said, not much; for being young, and tender, it withers away to little or nothing, before the plants be fit for the hoe.

Two or three days ago, I examined this close of turneps; the plants are *thinner* than one would wish, (perhaps owing to their being badly hoed) but there is not a "*squally patch*" in the whole piece.

There may be two advantages arising from letting the soil lie some time before the last plowing: it acquires a degree of texture, and moistness, favourable to the infant plants; and is prevented, by the dead weeds, from being, afterwards, run together by heavy rains.

72.

CATTLE AT
TURNEPS.

FEBRUARY 10. Asking Mr. A. Bayfield, if his cattle were not sometimes *choaked* with
turneps;

turneps; he said no; he never lost but one in his life. I asked him if he used a rope: he said he had one; but never used it, except the time he lost his cow. If salt and water will not cure them, he pours down a hornful of *salt and melted grease*; such as hog's-lard or any kind of common grease. This he never (except the once) found fail.

This is an idea worth preserving: warm oil and salt would perhaps have the same effect.

Mr. Bayfield, who may be called one of the most orthodox farmers in East Norfolk, is clear in that a *three-year-old* "homebred" will fat as kindly as a *four-year-old* "marshlander" or "Scot."

He instanced it, to-day, in a three-year-old of his own bringing up, which he bought; when a calf, of the calf-drovers; and which evidently discovers a near relationship to the short-horned breed. He is now at turneps with the rest of the three-year-old Norfolk stock; but, notwithstanding he was at head keep all last summer, he is nevertheless still a rawboned growing steer; while the Norfolks are as soft as moles, and several of them begin to drop their points. The Norfolks will fat to from forty to forty-four stone; the Lincolnshire, if

72.

CATTLE AT
TURNEPS.BREED OF
CATTLE.GRAY-MEAT
MORNING

72.

BREED OF
CATTLE.

he were to be kept another year, would reach at least seventy.

But this peculiar quality of the Norfolk stock does not depend on size; for Mr. B. says, that a three-year-old Scot (still smaller perhaps) is as difficult to fat as a three-year-old marsh-lander. He says, it is bad management to attempt it; but keep them on until they be four years old, and they will make famous "over-year" bullocks: adding, that at that age they will generally pay for keeping over-year.

73.

FARM-YARD
MANAGEM.

FEBRUARY 10. It seems to be a received idea among the Norfolk farmers, that the straw which is *eaten* by cattle is in a manner wasted as to manure. Mr. S. I remember, as an argument in favour of his plan of fattening pigs loose in the open yard, said what a rare parcel of muck they make, compared with what neat beasts would have made from the same straw. "A parcel of lean hungry stock, says he, come into a yard and eat up all the straw: see there lies a bundle of straw as big as a man can carry."

Mr. B. the other day, intimated the same idea: however, on putting the question, he acknowledged

knowledged that a little dung and a little trodden straw do well together.

In the north of England the farmers make their cattle eat almost every blade of their straw, so that they have scarcely any left to litter their stalls with. Give a Yorkshire and a Norfolk farmer equal quantities of straw, the Yorkshireman would keep more cattle, and carry out his dung at a less expence; whilst the Norfolkman would make more muck. But quere, Whether is the manure better or worse? and quere, Which of the two, upon the whole, is the better management?

Much perhaps may depend on the quality of the soil to be manured. A large quantity of long dung would, perhaps, for stiff cold land, be better than a smaller quantity of short. But perhaps, for a *loamy* soil, short dung is the best.

74.

FEBRUARY 12. In my rides, this winter, I have endeavoured to inform myself respecting the *winter-management of store-cattle*.

CATTLE.

Mr. A. Bayfield's yearlings and milch-cows follow his bullocks, and lie in the par-yard at night: his two-year-olds, and dry cows, go abroad in the meadows, &c. in the day, and are

K 3.

put

73.
FARM-YARD
MANAGEM.

74.

WINTER
MAN. OF
CATTLE.

put into the par at night: they have not yet had a turnep. Mr. B. says, however, he shall now begin to give them some; for if young stock are starved in the spring, they are stunted for the whole year. Cows in calf, he also justly observes, will do with less keep than any other stock, until within a few weeks of their calving.

Mr. John Hylton.—His turneps failing, he has few bullocks this year; and these he buys turneps for; and brings home some for his cows. Neither his two-year-olds, nor even his buds, have yet broken a turnep this year; he having the principal part of the few turneps he grew still upon the ground; saying, that he should be distracted if he had not a plenty of feed in the spring; so as to be able to favour his ollands, until they got a good bite, and the ground covered. A good farmer never starves his stock.

Mr. Jonathan Bond, of Walfham, makes three divisions in his par-yard: his buds; his two-year-olds; and his cows. Says, that the gargut, some people think, comes from the buds being “horned” by the larger cattle; but says, he does not believe that there is any thing in it; for notwithstanding his precaution, he has lost three this year by the gargut.

Mr.

Mr. James Helsden, of Suffield, stows his buds in a battoned stack-yard, at the end of a barn. He always takes care to place such corn in this stacking-place, as will require to be "barned" the beginning of the season; so that he has it every year free in time enough for a "calves par" (a good plan).

Mr. John Joy, of Walsham, has now six or eight cows, ten two-year-olds, and eleven buds follow his bullocks: his young stock had no turneps till after Christmas.

Mr. Edward Bird, of Plumstead, has his two-year-olds out at keep as followers at one shilling a week: they have plenty of turneps, and go into a par-yard at night.

Mr. William Mann, of Bradfield, has eight buds out at keep for ten-pence halfpenny a head a week. They have their fill of fresh turneps, every day; going "at head;" not as followers. He grazes his two-year-olds, this year: in general he sells them in the spring to be kept over-year; but this year they being forward he fats them himself, and they are doing extremely well.

74.

WINTER
MAN. OF
CATTLE.WINTER
KEEP ON
TURNEPS.

75.

GEN. MAN.
OF FARMS:

FEBRUARY 12. Every soil seems to have its own stock.

In Lincolnshire the soil is rich; the grafs long and soft; and the sheep there are large and inactive: In Norfolk the soil is less productive; the grafs short and hard; and the sheep light and active.

A sheep-walk, in this neighbourhood, stocked jointly with these two *varieties* of sheep, contains also a *variety* of soil: one part, lying low, is a rich, moist soil; bearing a soft rich grafs: another lies high, and is a drier lighter soil; bearing a hard benty grafs.

BREED OF
SHEEP.

The present stock were principally bred in this ground; and, whether Norfolk or Lincolnshire, were many of them perhaps dropt near the same spot on the same day; nevertheless turn them miscellaneously into this ground and they will, in a short time, separate themselves, even to a sheep; the Lincolnshires* drawing off to the Lincolnshire soil; and the Norfolks to their own dry sandy loam: and, whilst there continues a plenty of grafs in both parts, the two breeds will keep themselves as distinct and separate as rooks and pigeons.

* Including a mixture of the Huntingdon and Leicestershire breeds.

76.

76.

FEBRUARY 12. The long-wooled ewes (see last MIN.) have lambed with great difficulty, this year. The shepherd has been obliged to assist the major part of them.

BREED OF SHEEP.

These ewes were therefore kept at grass until after they had dropt their lambs; the shepherd having been taught by experience that ewes at turneps are liable to mortify, upon receiving the smallest injury in lambing; much more liable than at grass.

MAN. OF SHEEP.

77.

FEBRUARY 12. There seems to be something peculiar either to the air or the soil of this county. The face of a ditch, though formed of a dead ill-coloured substratum of mould, becomes, in a few years, black and rich in a high degree; so as to be coveted by the farmer almost as much as dung. When he re-makes his fence he carefully saves this rich, or rather enriched, mould (for according to the custom of ditchers the face is always made of the worst mould): or, if he throw down a fence, he as assiduously preserves both the face and the back for the bottoms of his farm-yard or dung-hills.

SOIL.

Does not this incident afford us an idea applicable to the enrichment of the soil in general?

ral?

77.

SOIL-PRO-
CESS.

ral? Is it not highly probable, that by ridging up a fallow so as to resemble the banks of ditches, or as nearly as could be done with implements and horses, the soil would thereby be meliorated?

It might certainly be done in this way: with a common plow, gather up the soil into four-furrow or six-furrow ridges, and afterwards, with a heavy double-mould-board plow and a strong team, force up the whole, by degrees, into high, sharp, angular ridges; which, in due time, might be reversed in a similar manner*.

78.

FEBRUARY 16. Last night being uncommonly severe, by wind frost and snow, I rose early this morning, to observe the effects of such unusual severity upon the young lambs.

I expected to have found them shivering and setting up their backs, pinched through with cold: instead of which they were prancing against the trees, and running races in a stack-yard upon some hay which the ewes had pulled out, as if the sun had shone out in the middle

* This would likewise give an opportunity of deepening the soil; and of forming, if practicable, a fresh pan. (See SOIL, Vol. I).

MAN. OF
SHEEP.

of April!—not one pitiful tone, nor a crooked back, among near a hundred and fifty.

The ewes have been well-kept all winter; and have now plenty of turneps, and a rough hay-stack to run to. This shews the effect of good keep: the shepherd very properly observed, that let lambs have plenty of milk, and they neither fear nor care for any weather.

What a pleasure, and how profitable, to do well by stock! Had these ewes been ill-kept, numbers of lambs must have been lost during the last fortnight of severe weather; whereas, with their present flush of milk, scarcely one of seven or eight score has suffered by it.

79.

FEBRUARY 23. A considerable part of a farm which lies toward the coast, being hilly and very badly soiled—more especially the tops and sides of the hills, which have always been full of rabbits in spite of all endeavours to destroy them—the tenants last year applied for leave to convert this part, about ninety acres, into a rabbit-warren. Leave was given, and an allowance made them of half the estimated expence of raising a sodwall fence round these ninety acres.

The

78.

MAN. OF
SHEEP.

RABBIT-
WARREN.

79.

RABBIT
WARREN.

The fence is nearly finished, and the warren has this year turned out beyond expectation: it is valued, by one who ought to be the best judge of its worth, at forty pounds a year; which is nine shillings an acre.

As the part of a farm, these ninety acres are not worth five shillings an acre: at the present price of barley, they are not worth more than four shillings an acre.

Thus, for ten pound a *real* improvement of twenty pound a year has been made and secured; for the warrener will, through necessity, hereafter keep the fence in repair.

The fence is made about four feet high, and three feet thick; faced with green-sward; and capped with furze, so as to project eight or ten inches over the face. Some of it was done for a shilling a rod; but the spring putting in, fourteen or fifteen pence a rod of seven yards was obliged to be given.

A neighbouring warrener, this winter, gives nine-pence for the wall, without the capping; which he does not mean to put on till the wall be thoroughly settled. This is very judicious: several rods of that abovementioned shot down in different places.

There are several patches in the vallies and some on the tops of the hills which have usually
been

been tilled. Some of these were last year, and some of them ought to be every year, cultivated for the rabbits: thus, when the grass gets foul or mossy, plow it up; fallow; sow turnep-seed for present feed (they will not let rape get up), and to prepare the soil for barley and grass-seed the ensuing year. Thus a regular succession of feed might be kept up.

The way the Norfolk warreners take to destroy eagles, kites, and other birds of prey is natural and simple. These birds are shy and suspicious: they like to settle where they can have a clear view round them for some distance: a naked stump or a hillock is their favourite resting-place. The warreners, therefore, raise mounds of earth of a conical form in different parts of the warren, and place steel traps upon the points of those artificial hillocks.

80.

FEBRUARY 28. About two months ago I took a sample of wheat to North-Walsingham market; with an intent to make myself acquainted with the business of the corn-markets in this country.

North-Walsingham is an afternoon-market (see MARKETS, Vol. I.); corn all sold by sample; some

79.

RABBIT-
WARREN.

MARKETS.

80.

N. WALSHAM
CORN-MARK.

some in the market-place; but chiefly at the Inns.

Having made my election of a miller, and finding that he "quartered" at the Bear, I went to his room (he was not in till near six) and shewed him my sample: namely, about two handfulls, put in a piece of brown paper; which, agreeable to the fashion of the country, was gathered up in the hand, and tied with a string, in the manner of a pounce-bag.

He asked the price; I told him the best he gave that day: he said a guinea was the highest: I had previously understood that a guinea was "the top of the market," and sold it him at that price. He asked how much there was of it; I told him about fifteen coombs. He marked the name, the quantity, and the price upon the bulge of the paper, and the business was done.

His room was set round with farmers, who, the conversation being audible, were witnesses to the bargain.

Another sample I took to his mill; wishing to see the construction and economy of a Norfolk mill;—and afterwards sold him the remainder of the quantity; namely, about thirty coombs.

Not

Not having received for the two former parcels, he desired I would give him a week's notice before I called upon him for the money. —Last week I gave him notice, and this evening I have been to receive it.

His room was full of farmers, smoaking their pipes, and drinking *punch*; excepting one, with whom he was doing business at a side-table.

My turn presently succeeded; and we agreed the account thus:

1782.			
Jan. 10.	15 Co. 3 Bs.	“bare;” or 15	
		Co. full measure, at 21s. a	
		coomb, or 21l. a last of	
	21 Co.	- - -	15 15 0
26.	16 Co. 3.	at 21l. 10s. -	17 2 11
Feb. 9.	15 Co. 3.	at 22l. 10s. -	16 17 6
16.	14 Co. 3.	at ditto -	15 16 1
	63 Coombs bare		£. 65 11 6
From which he deducted 1s. a last (of	21 Co.)	for what he called “carriage,”	
being a perquisite to his servants,			0 3 0
			£. 65 8 6

Having received the amount, *signed a receipt*, and thrown down a shilling towards the liquor, the business was finally concluded.

80.

N. WALSHAM
CORN-MARK.

81.

PLANTING.

FEBRUARY 28. Mr. A. Bayfield asking me if I would not have some "wood-layer" put into the places where the pollards (*oaken* pollards) were taking out against Suffield Common, I told him yes, he might have a little oak-layer. "Why," says he, with his usual coolness and good sense, "would not a little ash-layer think you, Sir, be better? I have known ashes thrive rarely well after oaks, but have seldom known oak-layer take where an oaken timber or pollard has been taken down."

This is a valuable observation. It has long been observed, that an old orchard seldom bears planting as an orchard a second time: nor is wheat after wheat, equal to pulse or grass, after wheat; or wheat after pulse or grass.

82.

BREEDING
SHEEP.

MARCH 1. In drawing off some mixt-breed hoggards for sale, it is observable, that those between long-wooled ewes and a Norfolk ram are handsomer stock, and forwarder, than those which have been bred from Norfolk ewes by a Leicestershire ram; and that in *this* case the ewes have always great difficulty in lambing.

83.

MARCH 2. Asking a sensible intelligent farmer, who rears a large proportion of calves to the number of cows he keeps, how he gets milk for his calves, he answered, "turneps give the cows such a flush of milk the calves seldom want."

Turneps, he says, are fine things for cows: they scour and cleanse them, and set them forward in the spring, when they come to be turned out to grafs; adding, that cows kept at dry meat, not only lose their milk in winter, but the best part of the spring-grafs is gone before they get to the full of their milk.

This may be one reason why cows which have no turneps do so badly in this country; whose hay is dry and strawy; and the grafs far from being of a succulent quality.

84.

MARCH 3. This morning I stood a considerable time to see some fattening heifers "break" their turneps. Being all at feed, they let me stand among them unnoticed; and having been about four months at this employment, they performed it with a dexterity, which afforded me considerable entertainment.

83.

TURNEPS.

COWS.

BULLOCKS
BREAKING
TURNEPS.

84.

BULLOCKS
BREAKING
TURNEPS.

In theory, it seems difficult for an animal, destitute of paws, and with teeth only in one jaw, to get to pieces a turnep, which he cannot contain in his mouth; more especially when it is thrown loose upon hard ground: one is led to imagine, that it would roll or slide away from him, as he attempted to bite it; but no such thing happens. I saw several turneps begun and finished without being moved an inch from the place they fell in from the cart. Had the bullocks been furnished with paws, or even hands, to hold them with, they could not have done it more dexterously.

Having smelled out a turnep they like, they press it hard against the ground with the gums of the upper jaw, applied upon the top of the turnep, toward the side which lies farthest from them, steadying it with the upper lip: then inserting their teeth on the opposite side and biting somewhat upward, they take off a small piece, proportioned, in some measure, to the size of the turnep. Having tasted the first bite, and smelt at the broken part, they take another slice; perhaps not thicker or larger than a crown-piece: and thus continue to take off, or rather scoop out, slice after slice until nothing is left but the tail of the turnep, and a shell

a shell of rind, in the shape of a fleeting dish; and of a similar thickness; carefully smelling, between the bites, at the part they intend next to take off.

The crown and upper part of the rind they eat, but seem studiously to leave the tail, and the under part of the rind, which had stood in contact with the soil.

If a bullock break off a larger piece than he can gather up with his tongue as his head hangs downwards, he lifts up his head, and shoots out his nose and neck, horizontally, until he gets it between his grinders. Crowns, and very small turneps; he treats in the same way.

This part of the business, however; he performs somewhat clumsily; and it is, probably; in this act that a small turnep, or a piece of a large one, glancing from between the teeth, gets into the throat and causes sufflation, or "choaking".

The tongue of a bullock is less flexible; and worse adapted to the purpose of turning over and adjusting a morsel of solid aliment, than are the tongues of carnivorous animals, or those of the human species. The natural food of graminivorous animals is soft, and no way liable to slip from between the teeth in grind-

84.

BULLOCKS
BREAKING
TURNEPS.

84.

BULLOCKS
BREAKING
TURNEPS.

ing; their tongues being adapted to the purpose of gathering up their aliment, rather than to that of assisting them in chewing it.

85.

TIMBER.

MARCH 3. In thinning timber-trees, whether in hedges, or in open grounds, it is generally advisable, when two trees grow amicably together, their branches intermixing, and their tops of equal height, forming as it were one top, to leave them both standing: for, if one of them be taken away, the beauty of the other is spoilt, and its atmosphere changed: the evil effect of this treatment I have frequently observed.

But when one of them has got the superiority so far as to overhang the other, it is generally right to take the underling away, and thereby add beauty and strength to the master-plant.

Twin timbers, however,—more particularly double stems growing from the same stub,—are dangerous to horned cattle. I have lately heard of more than one accident by trees growing so near together that cattle could just get their horns through between them; and having got them there could not find the same way to

ex-

extricate them; but falling down in the struggle, were strangled. I have since heard of a horse being lost in a similar manner*.

85.

HEDGE ROW
TIMBER.

86.

MARCH 5. Mr. John Waller, of Antingham, shewed me, to-day, seven ewes with fourteen lambs by their sides: and a fifteenth, which he gave to his boy, is also alive.

BREED OF
SHEEP.

Last year he had nine lambs from three ewes; eight of which he actually reared, and are now alive; namely, six with the ewes, and two "cotts" or "cotties" (a name for lambs reared by hand; a common practice here).

His sheep are, in appearance, of the true Norfolk breed. He says he has had the breed eight or nine years, and they have seldom had less than two lambs a piece. *He keeps them well.*

The Norfolk ewes, in general, bring but one lamb.

* A still more singular accident occurred to my own knowledge. A mare, probably in fighting with the flies, struck her hind-foot into a cleft between two stems of white-thorn, open at the bottom but narrowing upward; and being a high-bred, spirited mare, struggled until she tore her foot off; leaving it behind her in the cleft!

87.

87.

RENEWING
HEDGES.

MARCH 5. When the white-thorn is dead thro' age or improper treatment, or from being overhung by trees or stub-wood, it is difficult to get young layer to "take" in the old bank. There are two things against it; the dryness of the bank; and its having been already *cropped*.

These two objections are in a great measure removed, with little inconveniency, or additional expence, by throwing the bank entirely down, about Michaelmas; letting it lie *fallow* all winter; tabling the new ditch the latter end of February; and putting in the layer, and finishing the fence, the beginning of March: for, by this means, the mould gets a thorough drenching, and receives the benefit of a winter's exposure to the frost and snow.

There are generally roots and stubs in an old ditch-bank sufficient to pay (in this county) for the labour of throwing it down; and the difference between making a new ditch and vamping up the old one, is not more than two-pence a rod.

This Minute arises from a tenant's being desirous to remake a ditch, which is loaded with stub-wood of forty or fifty years growth; and which
has

has so totally destroyed the quick, that fresh layer would be wanted from end to end.

On examining the bank I found that, from the cover of the pollards and stub-wood, it is, even now, as dry as chalk; and entirely occupied by roots and fibres of various sorts. I therefore advised him to let it remain until Michaelmas, and treat it in the manner above described.

He acceded to this the rather, as it is a plan which is far from being theoretical in Norfolk, being, I find, frequently practised.

88.

MARCH 5. Riding across Felmingham Heath, to-day, I observed a piece of new ditch-bank, out of the face of which young furzes were shooting, in the place where quicksets are usually put in; but without any being amongst them.

Looking round, I perceived that this was not a mere experiment; for the neighbouring hedges (of a sort of an encroachment) were of the same shrub; and many of them invulnerable fences; even against the heath stock. One which had been recently cut in the face (with a few left on the top as a blind) was as

L 4

thight

87.

RENEWING
HEDGES.FURZE-
HEDGES.

88.

FURZE-
HEDGES.

thight as a wall. In general, however, they were getting much too old; some of them dying; and others thin at the bottom.

I am nevertheless fully convinced that a furze-hedge, *with proper treatment*, is, upon a light unproductive soil, a sufficient and eligible fence.

89.

THATCH.

MARCH 7. This morning, went to see *the method of cutting reed*.

The time of cutting reed does not commence until Christmas; and continues till the young shoots begin to appear: the sap is now beginning to rise; the stems, below the water, being already green.

The cutters have a boat to carry them from the banks to the "reed-rond"; which, in this case, lies at a small distance from the shore.

Some they cut standing in the boat; some standing on a plank, laid partially, or wholly, upon the mud and roots of reed, matted intimately together.

The workmen cut it upwards, gathering the reed in the left hand and arm under-handed, with sickles (reaping-hooks are too slippery for the reed) as much below the water, consequently

quently as near the root, as may be; it being an idea, even unto a proverb, that one inch below the water is worth two above it; for the part which now appears green changes to a blackish-brown, and becomes as hard as horn; whereas that which grows above the water is brittle, and of a more perishable nature.

Having encumbered their boat they push it to the shore, and make up the reed into sheaves (with thumbands made of straw) of such a size that five of them will make a fathom of six feet in circumference: (sometimes the sheaves are made six to a fathom) sixty of those fathoms are a load; and a hundred and twenty are termed a hundred of reed; worth about three pounds.

The mats of roots frequently separate in cutting the reed, and float about the water, still propagating reeds in small clumps; not larger, perhaps, at first than the top of a bushel.

This seems to be the speediest way of propagating reed; namely, separate the beds of roots; drag them to different parts of the water; and fasten them with stakes, until the roots get hold of the bottom.

The starlings have done considerable damage to this patch of reed: the outsides look fair;

89.

CUTTING
REED.PROPAGAT.
OF REED.

89.

STARLINGS
ENEMIES
TO REED.

fair; but the infides of the clumps are very much broken down, by their roosting among it; more particularly while it was green, before it had received a firmness of stem to bear them. I have seen thousands at once light among it. In the fens, the reed-men are great enemies to these birds; and (if one may judge from the proportional damage they have done in Suffield-pond) with great reason.

90.

HEDGES.

MARCH 8. I have at length nearly finished setting out this year's wood and ditching.

In the course of the season I have made the following observations, and have endeavoured to adhere to the following rules respecting timber-trees and pollards in hedges.

HEDGE ROW
TIMBER.

In regard to TIMBER-TREES, however, I have not been able to pursue entirely the line of conduct I have laid down from this and last year's experience: it may, nevertheless, be right, while the subject is full and fresh in my mind, to minute my present ideas on this important department of rural economy.

I am clearly of opinion, that all such timber-trees as are now decaying; *also* such as are full-grown, though not yet decaying, but are so situated as to overhang or otherwise
crowd

crowd the neighbouring stands or timberlings, or the young timber-trees which are in a more youthful and growing state; *also* such part of the growing timbers themselves, as, by standing too close, crowd and check each other, should be marked and sold at the present market-prices; though these prices may be somewhat below par.

For if to the interest of the money, which would arise from such sale, be added the decrease of value, or the injury incurred by suffering timber of the above description to remain standing, the proprietor of such timber is losing annually from five to ten per cent. of its present value, by such improper conduct. Thus suppose an estate has five thousand pounds worth of timber upon it, bearing the above description; its proprietor is losing from three to five hundred pounds a year by suffering it to remain standing.

Whenever the price shall hereafter rise to what may be esteemed a fair selling price, then, but not till then, falls ought to be made of all *full-grown* timbers; *also* of such growing trees as, from their situation, are or may soon become injurious to each other. Much, no doubt, depends on embracing the lucky moment of sale; nevertheless, perhaps, more
money

90.

HEDGE ROW
TIMBER.

90.

HEDGE ROW
TIMBER.

money has been lost than gained, by speculating nicely in this delicate matter.

The dead wood and hanging boughs of all timber-trees left standing ought to be removed; and the younger timberlings trained in such manner as will induce them to take the desired outline, and rise in the most profitable form. Oaks in hedges naturally grow low and spreading, doing more injury to the hedge and the adjoining inclosures than their own value, in that form, can ever repay; whereas tall well-headed oaks are at once ornamental and valuable to an estate;—without being, in any considerable degree, injurious to the occupier.

Being fully convinced of this, from almost daily observation, I am clearly of opinion, that every opportunity ought to be taken to propagate oaks in hedges; not by putting in young plants where old trees have been taken down; but by searching for, and preserving, young seedling plants (more especially where a hedge is cut down), and carefully training them up wherever a vacancy will admit them:—Or, if such do not rise naturally, by putting in transplanted plants in vacant hedge-banks and waste corners; at the same time dibbling acorns round them, in order that, in the course of a few

few years, the woodman may have his election of the properest plant to be trained.

90.

TIMBER.

This however is not the business of a day, nor of one year, but requires an annual attention; embracing convenient times, and favorable opportunities, as the business of the estate is prosecuted; considering this as one of the most material objects belonging to its management.

With respect to the POLLARDS, I have followed these rules:—

HEDGE ROW
POLLARDS.

Such as were not likely to throw out, in twenty or twenty-five years, a top equal to the present value of their stems, I valued to the tenants as fire-wood.

Thus supposing the body of an old pollard to be worth, as fire-wood, two shillings; but from the appearance of the present top, when compared with those of the neighbouring pollards, it was not likely to throw out, in twenty or twenty-five years time, another top of two shillings value, I marked it to come down, and charged the tenant two shillings for it, over and above the value of its present top: for the interest of the money will, at the end of that time, be more than the top-wood would have been had it been left standing; beside the
mould-

90.
HEDGE ROW
POLLARDS.

mouldering and waste of its own body, and the incumbrance it would have been to the estate.

Such, also, as stood particularly in the tenant's way, or which crowded a young stand or timber, or where they stood too thick, I took down, valuing them to the tenant as fire-wood; but with this invariable proviso, that if, on cutting off their butts, they proved sound, they were to be taken for the use of the landlord; the tenant having a deductory allowance made for the quantity of firing-blocks so taken.

Also, if a pollard, of a proper size, appeared to be at present sound enough for a gate-post (more particularly if gate-posts were wanting upon the farm they stood on), but which from its present appearance it would not be at the time the ditch would want to be made the next time, I marked it to come down:—for a good hanging-post is worth five shillings; whereas a firing-pollard of the same size is not worth more than one shilling.

But such thriving pollards as did not stand particularly in the way of the fence or the tenant, and such as were not wanted for any particular use; also such as were likely to throw

out

out another top, and stood well upon the bank, so as not to injure materially either the tenant or the fence, I invariably left standing: for, although coals may at present be plentiful, and coasting-vessels sufficiently numerous, and have an unobstructed passage from Newcastle to Cromer; yet who can foreknow the revolutions in nature and nations which may hereafter take place? and who will be hardy enough to say that East-Norfolk cannot experience a want of materials for firing? The face of the country is no doubt at present too much encumbered with pollards, to the great inconveniency of its present occupiers: but it may be well to lessen their number with a prudent hand; lest, by sweeping them away indiscriminately, we may entail on posterity a still greater inconveniency.

91.

MARCH 14. On Monday evening last, about eight o'clock, the wind rose very high; blowed hard all night; continued blowing all day on Tuesday; and in the evening blew a violent gale.

There

90.

HEDGEROW
POLLARDS.

REPAIRS.

91.
REPAIRS.

There has scarcely one thatched roof upon this estate escaped, entirely, its fury. Many of them however are only ruffled; but great numbers (an hundred at least) are broken, more or less; some of the breaches considerable: whilst the tiled roofs have escaped without any considerable injury.

Had the practice proposed in MIN. 63. been adopted a few years ago, perhaps not a breach would have happened; for where the roofs have been overlooked in the course of the last year, even the thatched ones are hardly ruffled; whereas, in the state in which several of them still remained, there is three or four months work of a thatcher to repair them.

THATCH.

Reed in particular ought to be driven or relaid whenever it begins to slip, or the bindings begin to decay:—it is the reed-roofs in general which have suffered.

REED.

There is one advantage in reed, however; it may most of it be gathered up and relaid.

92.

REPAIRS.

MARCH 14. The bricklayer and thatcher employed upon this estate live at a distance.—

This

This inconveniency I have frequently experienced, but never so much as now, when such a number of petty, but exigent, jobs have been created by the late high winds:—the tenants are solicitous to have their furniture and their corn secured from the wet, and I cannot give orders to the thatcher or bricklayer without riding or sending two or three miles to them, or their coming as far out of their way to me:

Upon a large estate, a master or foreman carpenter, master bricklayer, thatcher, and blacksmith, ought to live in the immediate neighbourhood of the manager.

92.
REPAIRS.

GEN. MAN.
OF ESTATES.

93.

MARCH 16. Since the late severe weather set in, it has been remarked that bullocks abroad have done unusually ill; whilst those in sheds have done well. (See MIN: 69.)

Are not these a sufficient hints to farmers to keep their bullocks abroad in warm weather, and take them up, or at least par them, in severe weather? Whilst they are buds and two-year-olds, they are nursed in a warm well-kidded par-yard; but, at a time when they are en-

BULLOCKS
AT
TURNEPS.

93.
BULLOCKS
AT
TURNEPS.

titled to every indulgence the farmer can give them, they are exposed to the weather, be it ever so inclement; with scarcely a hedge to shelter them: their only shelter being too frequently nothing better than a row of naked "buck-stalled thornen bulls."—No wonder, then, that after the remarkably mild weather we had at the beginning of winter, the late sudden change should give a check to such as have been exposed abroad*; destitute of shelter, and, consequently, destitute of that temperature of *mind* as well as of body, which, *perhaps*, is essential to their thriving.

Mr. Cook, of Felmingham, whose opinion in this case is valuable, corroborates these observations; so far, at least, as they relate to the temperature of the body. A good lodging, he says, is a great thing to a bullock:—his expression was, "it keeps them warm within; and when they get up they stretch themselves, shooting out their hind legs as if they meant to leave them behind in the par-yard."—Whereas after having lain upon the cold ground, more especially if it be *wet*, they become cold on the inside; and, on rising, stick up their backs, with their four

* Homebreds are here spoken of.

“ feet drawn together, as if they were afraid to
 “ move them from the place they stand in.”
 Cold weather, he says, no doubt checks bullocks
 which go abroad very much; more especially
 if it be *wet*; adding, that “ if their *backs be dry*
 “ they do not so much mind the cold.”

93.

BULLOCKS
AT
TURNEPS.

94.

MARCH 25. AYLSHAM FAIR. This seems
 to be a fair appropriated to dealings between
 farmer and farmer, rather than to drovers and
 professional dealers. It is chiefly noted for
 plow-horses; which, at this season of the year,
 become valuable to the Norfolk farmer; every
 hand and hoof becoming busily employed
 against barley feed-time. It is, however, upon
 the whole, a small fair; and the fairstead un-
 commonly small and incommodious.

MARKETS.

To-day the number of cattle were very few:
 not more than one hundred head in the fair:
 and those in general of a refuse kind.

CATTLE.

It seems to be a fact, universally understood,
 that the quantity of stock in this county, has
 of late years very much declined. There have,
 it is generally allowed, been fewer young cat-
 tle reared of late than there were formerly:
 owing, it is thought, to the lowness of price;

M 2

arising

94.

FAIR OF
AYLSHAM.

arising probably from a scarcity of money, and from the failure of the turnep-crops for some years back.

CATTLE.

The few which were in the fair to-day seemed principally to consist of such as had been at turneps; and had got a little fleshy; but still required a considerable time, and good keep, to finish them. There were also a few cows and calves, and a little young stock. The number of horses was considerable (perhaps a hundred) set up against rails, placed on a rising ground, to shew their fore-hands to advantage. Ten to twelve pounds the highest prices; even for young horses.

HORSES.

95.

PLANTING.

MARCH 26. This morning marked out the weeding-plants of a plantation, made by the late Sir William Harbord twenty-five to thirty years ago*.

It consists of the following species of trees:—

Oaks,	Scotch Fir,
Ash,	Larch,
Beech,	Alder.
Chestnut,	Hornbeam.

* On counting the rings of different species, I found the number to be thirty or thirty-one.

The

The *Scotch fir* has outgrown every other species; and the plants, though few, are become a burden to the grove. The wood being of quick growth, the plants have not only out-topped the rest, but have, in general, had time enough to furnish themselves with boughs on every side; so as to cripple the beautiful oaks and beeches which stand near them. If therefore Scotch firs be planted in a grove, by way of variegation, they ought to be kept trimmed below; which would check their growth, and in some measure prevent their doing mischief: but, even with this restriction, they ought to be admitted into society with a sparing hand.

The *larches*, too, where they stand free from the Scotch firs, are of a considerable size; but they are not equally mischievous with those; their boughs being less extensive, and more rotted off below: they are, nevertheless, injurious to their deciduous neighbours. Where they stand thick, among the firs, they are drawn up strikingly tall and slender, or are so much over-hung as to be crippled, or entirely smothered.—Marked great numbers that were dead or dying.

The *oaks* are many of them beautiful plants; but are either entirely crippled by the firs and

95.
PLANTING.

larches, or, where there is any head-room, are drawn up much too tall and slender.

The same may be said of the *beeches*; and it is curious, though painful, to see how they struggle for the light, wherever they can see a peep-hole.

The *ashes*, too, where they stand among the firs and larches, are either smothered outright, or are drawn up much too tall and slender. In a part where they stand alone, without any admixture except a few alders, there are some most beautiful plants.

The *chestnuts*, if one may judge from this instance, is totally unfit for a miscellaneous grove. There is scarcely one of this species enjoys the smallest portion of sun-shine: the few which still exist are chiefly underlings; and some of them not much larger than when they were planted.

It must be observed, however, that much may depend on the *soil*. This plantation divides a rank moory meadow from a good, sound, upland soil; some parts of it partaking of the former, some of the latter quality.

The larches and the chestnuts, obviously, do best on the dry soil. The Scotch firs, too, seem to have gone off upon the moory soil;
there

there being some, but very few, left upon it; and those coarse and stunted. The ashes do remarkably well on the moory parts. In one particular place; not the wettest; there is a parcel of perhaps the most beautiful plants that ever grew—their skin as smooth and clean as that of the beech; and, though not more than twenty-one inches in circumference, they are not less than forty feet in height; and as straight as gun-barrels. The oaks, beeches, and a few hornbeams, thrive wherever they have been planted, and can get their heads out. They do not, however, seem to have been planted on the very wet parts.

95.
PLANTING.

The largest of the firs measure in circumference, at five feet high, - 39 inches.

Larches, - - 36

Chestnuts, r - 28

Beeches, - - 32

Alders, - - 32

Ashes, - - 21

Oaks, - - 28

Hornbeams, - - —

The greatest collective height of the plantation is about forty feet.

This plantation furnishes a striking instance of the mischiefs ensuing from the want of a proper attention to infant-groves.

95.

WEEDING
PLANTATIONS.

In this case, judicious thinnings would, evidently, have been highly advantageous. Great numbers of plants have perished, and come entirely to waste; and, of the two hundred and eighty which I have now marked, one hundred are dead, or nearly so.

This, however, is the smallest share of the loss; for those still remaining are drawn up too tall and slender; and with tops too small and insignificant, to make due progress towards large timber-trees.

In point of *profit*, the best method now to proceed by would be, to take down all, or the greatest part, of the Scotch firs; trimming up the few, which perhaps might be left with propriety; and thinning very considerably, *but by degrees*, the larches, and such of the other species as might require it.

But, in point of *ornament*, this, for a few years, might be injurious: however, in the end, both ornament and utility would, beyond a doubt, be increased by it; and the immediate acquisition of materials for repairs would be very considerable.

How many entire roofs of cottages, lean-to's, and other out-buildings; and what a supply of rails, common ladders, and rough scantling might

might be drawn from this small plantation : enough to keep the common buildings of the estate in repair for some years : and this, too, with a trifling expence of sawing, compared with that which is necessary to the reduction of grown timbers into small scantling*.

95.

WEEDING
PLANTA-
TIONS.

96.

APRIL 3. Spent the afternoon with the Rev. Mr. Horfeley, of Swayfield ; and walked with him over his improved meadows.

MEADOWS.

They are the only meadows in the county (at least that have fallen under my observation) which have been managed with any degree of spirit or judgment.

Mr. Horfeley says, that when he purchased them (some eight or ten years ago) they were a mere morafs : so very rotten that it was difficult even for a man to walk across them ; producing very little herbage superior to rushes and moss. They are, now, (even after this uncommonly wet season) firm enough to bear the largest cattle ; and are covered with a turf equal in appearance to the richest grassland.

* I flatter myself no apology is necessary for the length of this Minute : planting is an important branch of rural affairs ; and it is in tall plantations, rather than in the nursery, we ought to study the great principles of the art.

Mr,

96.
MEADOWS.

Mr. H.'s plan of improvement was this: Having lowered a rivulet, which runs through them, so as to sink the surface of the water about four feet below the surface of the meadow, he cut drains, seven feet wide, and four feet deep, *parallel to the rivulet*; and, with the excavated mould, filled up the small drains which had formerly been cut; and levelled the other inequalities; so as to render the surface smooth and even.

These drains were at first made at about twenty or thirty yards distance from each other; but Mr. H. is now filling the major part of them up; they having performed the office of laying the ground dry; and he is of opinion, that the rivulet and the fence-drains, alone, will be sufficient to keep it so.

These meadows consist of eighteen acres; divided at present into four "shifts," by the rivulet and two parallel main drains; which are barely seven feet wide; but the cattle sometimes attempt them; and eight feet—say half a rod—is the least width that fence-drains ought to be made.

The rushes were subdued by the sith, the moss by manure, and the herbage improved by the sweeping of the hay-chamber scattered on

in

in the spring. Neither the harrow nor the roller has yet been introduced.

Mr. H's method of treating his meadows, now in their improved state, is, to feed them every year, and to shift his stock repeatedly; beginning at one end, and proceeding regularly, so as to make two or three revolutions in the course of the summer: and, whenever he takes his stock out of one of his pieces, he makes a point of sweeping down the weeds and rough grass. An admirable practice; by which a fresh rowen-like bite is prepared against the return of the stock; besides the weeds being thereby effectually kept under.

Mr. H. says, that he has fattened both sheep and bullocks on this improved morass; and that they fat very kindly. He further says, that it gives cows a great flow of milk; and Mrs. H. says, that the butter from it is perfectly good.

Enquiring of Mr. Horfeley, if he had kept an account of his expences since his first purchase; he said, no; but was clear in the main fact; namely, that the improvement greatly exceeds the expence of improving: adding, that he could have sold the land in its improved state for twice the amount of the purchase-money.

It

96.

GRASSLAND
MANAGEMENT.

ENCLOSURE

ENCLOSURE

96.
MEADOWS.

It has every appearance of being now worth from twenty to twenty-five shillings an acre.

97.

BULLOCKS
AT
TURNEPS.

APRIL 14. I have given particular attention to the management and progress of the two lots of bullocks, which I was present at the buying of, at St. Faith's fair. (See MIN. 27.)

It is a striking and interesting fact, that, notwithstanding there was only fifteen shillings a head difference in the purchase-money of these two lots, there is not less than forty shillings a piece difference in their present value.

A great advantage, no doubt, arises, to a judge of cattle, from having the choice of a drove; drawing out only a few of the head bullocks. But in this case the drove was small; and I remember Mr. B. was dubious in his choice of the last two or three of his lot: the disparity, therefore, at the time of purchase was not very great; being, in some individuals, scarcely perceptible to the eye of a judge.

From these and other circumstances, I am convinced that much depends upon the *management* of bullocks at turneps, as well as upon

upon judgment in purchasing them: for, of several parcels of fating bullocks, which I have had an opportunity of making my observations upon this winter, none have done equally to Mr. B's lot of heifers.

His turneps, no doubt, are good; and so are those of many of his neighbours; and the superiority of management appears to lie in letting them have plenty of fresh turneps; with plenty of followers; and in their being regularly shifted every day.

98.

APRIL 14. What a trifling expence of labour has been incurred by — farm, from Michaelmas 1780, to Michaelmas 1781.

It contains near four hundred acres of arable land; with about fifty acres of meadow.

The whole expence of workman's wages, the harvest month included, is no more than

To which must be added, the bailiff's salary

	£. 186 2 7½
	35 0 0
	£. 221 2 7½

Thus the whole expence of labour and house-keeping (for the bailiff and all the men boarded themselves and drank their own beer) is not

nearly

97.

BULLOCKS
AT
TURNEPS.

GEN. MAN.
OF FARMS.

98.

LABOUR.

nearly equal to the rent of the land: for this farm, if freed from game, is worth from two hundred and fifty to three hundred pounds a year.

RENT.

A farm of the same magnitude in Surrey or Kent could not have been managed for twice the money. And this accounts for the high price which land bears in Norfolk. Land which lets here for fifteen shillings an acre, would not in Surrey or Kent (at twenty miles distance from London) let for more than half the money.

LABOUR.

The lowness of day-wages; the quick dispatch of business; and, most especially, the practice of plowing with two horses, and going two journies a day; account in a great measure for the disparity.

SOIL-PROC.

99.

SHEEP.

APRIL 16. The shepherd telling me that a cutter in the neighbourhood could extract the concealed testicles of ridgil lambs; and he having last year experienced the inconveniency of three or four of these troublesome and dangerous animals, I let him send for him. This morning he has cut three; the whole number, it seems, this year. They are now from six to eight weeks old.

Having

Having cut off the end of the bag, and drawn the testicle contained in it, he proceeded to take the other out of the side opposite to that on which the palpable testicle lay*.

The lamb was laid flat on its side, upon the ground; one man holding it by its neck and fore legs; and another stretching it out, by drawing its hind legs back; both of them at the same time pressing their hands hard to the ground; so that the lamb had no liberty to struggle.

The cutter then clipped off a patch of wool, about the size and shape of a duck's egg, close below the loin, and about half way between the huckle and the short ribs.

He then made an incision wide enough to admit, freely, his fore finger; with which he searched for the stone, and presently brought it out; and, disentangling it very dexterously from the film with his knife, drew out the string.

He immediately sowed up the orifice, and coated over the wound with cart-grease.

It is remarkable that the concealed testicles

* It increases the difficulty in cutting ridgils, when the palpable testicle has been priorly extracted; as the operator, then, knows not which side to cut on; and is frequently obliged to cut both sides before he finds the concealed testicle.

99.

CUTTING
RIDGIL
LAMBS.

99.
CUTTING
RIDGIL
LAMBS.

all lay on the same side; namely, the right side; the contrary side to that on which females are cut. This made the operation rather awkward to his hand; he nevertheless performed the business so skilfully, and with so much dexterity; that he extracted the two first in a few minutes. But the last was a remarkably difficult case; the testicle being very small, and braced up close to the vertebræ; and it is observable, he could scarcely draw the palpable testicle of this lamb out of its bag: the punishment to the animal seemed full as much in one operation as the other.

The price of cutting, a shilling a piece.

APRIL 22. The wind being cold, kept them in the house all night:—but the cutter, though the wind continued very pinching, thought it proper for them to go out in the day-time for the sake of exercise: they got very stiff for some days, but are now doing very well.

APRIL 30. One of them, nevertheless, is since dead:—owing, I apprehend, entirely to their being too much exposed to an unusually piercing easterly wind.

100.

100.

APRIL 20. There is an alertness in the servants and labourers of Norfolk, which I have not observed in any other district.

WORKMEN.

That "custom is second nature" is verified every hour. How quick and alert are the tradespeople and handicraftmen in London! They will dispatch as much business in a given time as the very same people, had they been bred in some parts of the country, would have done in twice that time. The case is similar with the Norfolk husbandman. Whilst a boy, he is accustomed to run by the side of the horses while they trot with the harrows. When he becomes a plowman, he is accustomed to step out at the rate of three or four miles an hour: and, if he drive an empty team, he either does it standing upright in his carriage, with a peculiarity of air, and with a seeming pride and satisfaction, or runs by the side of his horses, while they are bowling away at full t.

Thus both his body and his mind become active: and if he go to mow, reap, or other employment, his habit of activity accompanies him;—and is obvious even in his air, his manner and his gait.

100.
WORKMEN.

On the contrary, a Kentish plowman, accustomed from his infancy to walk, whether at harrow, plow, or cart, about a mile-and-a-half or two miles an hour, preserves the same sluggish step even in his holidays; and is the same slow, dull, heavy animal in every thing he does.

That the Norfolk farm-labourers dispatch more work than those of other countries is an undoubted fact; and in this way, I think, it may be fully accounted for.

101.

MARKETS.

MAY 4. Went this morning to see the *clover-seed market* at Norwich.

The feeds are brought chiefly from Suffolk, and the Suffolk side of Norfolk. Many of them are in the hands of the growers themselves; some in those of jobbers, who collect them of the farmers. They are principally contained in coomb sacks, containing four bushels, of sixty-six pounds each, together with two pound a bushel for over-weight; so that a bushel is only a term used for sixty-eight pound of clover-seed, at Norwich market: or for sixty-six pound, in other parts of the county.

The feeds are principally brought into market in these coomb sacks; in which several hundred

hundred bushels may be seen standing: and in the middle of the market are a pair of large scales, adapted to the weighing of a whole sack, or a less quantity; the farmers paying so much a draft for the use of them.

Beside what are thus brought into market, the dealers have quantities at their respective warehouses*; and great quantities are also sold by corn merchants, and even bankers, by sample. Indeed, at this season of the year, almost every man of business, who has got a little loose money, is a dealer in clover-feed.

The market, however, does not consist wholly of red clover-feed:—there are proportional quantities of “suckling” (white clover); also of “hulled Nonsuch” (trefoil); also of “black Nonsuch” (trefoil in the husk); also of “white Nonsuch” (darnel or rye-grass); and of “black and white Nonsuch;” namely, a mixture of the two last sorts.

* One Cunningham is by much the largest dealer: he lives near Harleston; and buys up his feed in that neighbourhood, and in Suffolk. Enquiring as to the quantity sold, I was told (in the afternoon) that he had sold, in the course of this day, a hundred coomb of clover-feed!—thirty or forty coomb of it, however, were to country dealers.

101.

CLOVER-
SEED MARK.

The prices, more particularly of "clover," (that is, red clover) is very fluctuating: last year prime seed was bought from eighteen to twenty shillings a bushel. It has been known so low as fifteen shillings; and three pounds ten shillings a bushel has been given in this market.

To-day the prices were as follow:

Clover, twenty shillings to thirty shillings a bushel.

Suckling, sixpence to eight-pence a pound.

Darnel, twelve to fifteen shillings a coomb.

102.

BULLOCKS
AT
TURNEPS.

MAY 4. A fortnight ago, Mr. ——— sent twelve of his Scotch heifers, bought at St. Faith's, (See MIN. 27. and 97.) to Smithfield.

To-day he shewed me the salesman's account.

They sold from eight pounds five shillings to eleven pounds a piece—the neat proceeds a hundred and ten pounds, or nine pounds five shillings a head. They cost six pounds fifteen shillings; so that they left a profit of about fifty shillings a head.

They were at turneps about twenty-five weeks; and consequently paid no more than two shillings a week for their keep, notwithstanding the present high markets.

They

They were not highly finished ; but turneps being almost done, and grafs backward, the proprietor of them judged wisely in selling off the best of them now, that he may be able to finish the remainder the more highly with grafs.

103.

MAY 5. The late beating rains have washed down the face of many hundred rods of ditching. New-raised ditches have suffered most; but where the face looked to the north-east, ditches which have been made even two or three years, have suffered considerably.

Where new ditches have been raised this spring, in the Norfolk manner; namely, very upright, with the layer planted almost at the top of the bank; much mischief is done; for not only the face, but the layer also, lies by the heels in the "holl," for many rods in a place: and this, it seems, is a misfortune not uncommon in Norfolk; yet still the farmers persist in raising their live fences in this most injudicious manner.

I have the satisfaction to see those ditches which I raised last year, with an offset, and with the layer planted on the first spit,

102.
BULLOCKS
AT
TURNEPS.

RAISING
HEDGES.

103.
RAISING
HEDGES.

all standing: indeed, ditches raised in this manner, cannot readily take essential hurt by beating rains; for should either the foot or the upper part of the facing shoot, the layer is still safe.

It is the custom here to oblige the ditchers to make good the breaches of the first year, gratis. This, however, if the work was properly done, is this year rather hard upon them. But be this as it may, there needs not a stronger proof of the frequent *miscarriages* of Norfolk ditches than this custom.

104.

MAY 5. It seems to be a growing practice, in this country, to sow furze-seed on the backs, or rather upon the tops, of ditch-banks.

There is, however, one great evil attends it, when sown upon the top; for, growing quicker than the white-thorn, the furze, in a few years, over-hangs, and smothers the young hedgeling; especially if it be neglected to be cut down, or trimmed off, on the face side: a work which is too often, and, indeed, almost universally neglected.

But if the seeds be sown upon the *back* of the bank, this evil is in a great measure prevented;

vented; and the furze being principally intended as a defence of the back of the bank from cattle, it is extraordinary that the custom of sowing it upon the top should continue.

Last year I sowed upwards of a hundred rods, and this year about two hundred: my method has been this.

Two men, with a spade, a broom, and a common glass bottle, furnished with a perforated stopper *, proceeded thus: the first man chops a drill with his spade, from two to three inches deep, and at about two-thirds of the height of the bank. In this fissure the other man scatters the seed through the hole in the cork, at the rate of thirty long rods to a pound of seed. This done, one of them, in order to repair the cracks and partial breaches made on the bank by chopping the drill, pats it with the back of his spade above and below the mouth of the drill, which is purposely left open; whilst the other, with the broom, sweeping upwards over the mouth of the drill, covers the seed with loose mould; yet leaves the mouth

* A wooden cork, pierced with a gimblet, about the size of a swan's quill; the inside burnt smooth with a wire, and the outside bound with thread to make it stick securely in the mouth of the bottle.

104.

RAISING
HEDGES.SOWING
FURZE-
SEED.HEDGES
WOODS

104.
SOWING
FURZE
SEED.

sufficiently open to permit the young plants to make their way easily out of it; and to catch the rains which trickle down the upper part of the bank †.

Two men will sow 120 rods a day	0	2	4
Four pounds of seed at 15d.	0	5	0
	<hr/>		
	£.	0	7 4

Somewhat more than one halfpenny each statute rod, for seed and sowing.

HEDGE
WOODS.

On light sandy soils, in which the furze generally thrives abundantly, but where white-thorn, if the soil be barren as well as light, is an age in coming to a hedge adequate as a fence, the furze is the most eligible shrub to be propagated singly; and in every soil in which the plants will thrive, it is an excellent guard to the back of the ditch, forming a much warmer shelter for cattle than white-thorn, or any other deciduous shrub, owing to its numerous branches and leaves; more espe-

† The shooting of the bank is the only thing to be feared in this case; it ought not therefore to be made too steep; and ought, at the time of making, to be sowed with grass-seeds. (See HEDGES, Vol. I.)

cially

cially if these be increased by timely cutting; or, which is much preferable, by trimming off the ends of the branches.

The almost only inconveniency of a furze hedge is its becoming liable to be killed by severe frost. It is probable, however, that a hogged hedge would stand the frost better than one which is suffered to overgrow itself, and expose its roots and stems to the inclemency of the weather: even should a hogged hedge be killed to the root, it seems probable that thro' the numerousness and compactness of its stems and branches, it would remain a sufficient dead hedge, until another live one might be raised from fresh seed.

Another inconveniency of a furze hedge is, in theory at least, its shedding its seed, and over-spreading the adjoining land. This inconveniency, however, I have not seen in Norfolk; and I believe is not to be apprehended, if French seed (which may be had of any seedsmen in London) be sown,

104.

SPECIES OF
HEDGE
WOOD.

105.

105.

105.
MARKETS.

MAY 8. WALSHAM FAIR.—This fair, which is held the Wednesday se'nnight before Whitsunday, is a considerable fair for fat bullocks; also for cows and calves, and young stock.

The cattle begin to come in about seven, and continue coming until nine or ten; the fairs as well as the markets of Norfolk being held late in the day.

There were several hundred head of cattle at Walsham to-day, and had they been collected into *one* fair-stead, would have made a good show.

The principal buyers were the Norwich, the Wells, and the country butchers; also some dealers for the London and St. Ives's markets; and probably some under-finished bullocks were bought by those farmers who had grass and money of those who were in want of both.

I saw a steer and a heifer, good meat, and weighing about seventy stone the two, sold for sixteen pounds eight shillings, which is more than four shillings and eightpence a stone.

Also.

Also two large, but not fat, steers, weighing together about one hundred stone, sold for twenty pounds ten shillings, which is only four shillings and a penny a stone.

Also six two-year-olds, good meat, but not finished, and weighing about thirty stone each, for six pounds twelve shillings a head; about four shillings and five-pence a stone.

Cows and calves, in good demand; sold from three to six pound.

Lean two-year-olds worth from fifty shillings to four pound.

Yearlings (now near eighteen months old) from forty to forty-five shillings.

It is notorious, that there are very few *fat* bullocks in Norfolk this spring; owing, it is supposed, to the unkindness of the weather, and to the bad quality of turneps, which, it is said, are this year thicker-skinned, and of a weaker quality, than usual.

There were not twenty "right fat" bullocks in the fair: the few that have been finished this spring have been sent to London; the markets there having been very good.

Bullocks sold last Monday in Smithfield for upwards of five shillings a stone, and they have not fetched less than that price for several

105.

FAIR OF
WALSHAM.BULLOCKS
AT
TURNEPS.

105.
SMITHFIELD
MARKET.

ral market-days last past. But Smithfield market is a lottery; and, I apprehend, four shillings and sixpence at Walsham is a better price (charges and risque of road and market considered) than the *chance* of five shillings in London.

106.

DISTRICT.

MAY 12. On Friday morning set out in company with Mr. John Baker, of South-Reps, to see the country, and the celebrated husbandry of the FLEG HUNDREDS.

We went by the sea-coast, and returned by the "broads" and more inland parts of the country.

We passed through the following hundreds and parishes,

PARISH,

	PARISH.	SOIL.	HUSBANDRY.	106. DISTRICT.
N. Erpingham.	Thorp Market	light	passable	
	South-Reps	ditto	good	
	Gimingham	ditto	passable	
	Trunch	deeper	good	
E.p. & Tunstead.	Knapton	good	ditto	
	Pafton	ditto	ditto	
	Backton	ditto	ditto	
Happing.	Walcot	very good	ditto	
	Hafbro'	ditto	ditto	
	Leffingham	ditto, with marshes	ditto	
	Hempstead	ditto	ditto	
	Palling	ditto	ditto	
	Waxham	ditto, and very flat	Mr. B	
W. Flegg.	Horfey	ditto	ditto	
	Winterton	light, but rich	passable	
East Fleg.	Hemsby	} a rich loam, with com- mon fields	ditto	
	Ormesby		ditto	
	Kaister	ditto, with marshes	ditto	
	Yarmouth	} surrounded by low grounds and water	almost all common	
	Maltby		rich loam, with commons	nothing extraordinary
Filby	ditto, and broads	passable		
W. Fleg.	Burrow	rich loam	ditto	
	Rollefby	ditto	ditto	
	Repps	ditto, with common fields	ditto	
Happing.	Potter Hayham	do. with marshes & broads	ditto	
	Catfield	ditto, with low grounds	ditto	
	Sutton	still flatish	ditto	
	Stalham	good strong land	good	
	Brunsted	still strong	very good	
Tunstead.	East Ruston	yet friable	excellent	
	Redlington	strong good loam	ditto	
	Witton	ditto, some lighter	good	
	Edenthorp	ditto	ditto	
Backton	a charming soil	ditto		
Knapton to Thorp see above				

From

106.
DISTRICT.

From a general view of this detail, the hundred of HAPPING (and not the hundreds of *Fleg*) stands highest on the scale of husbandry: and, as I set out without prejudice, I could have no other bias to my opinion than that which I received from the objects which struck me.

FLEG.

The *soil* of the FLEG HUNDREDS is rich; some parts of it being naturally fertile, in a very high degree; and the rest rendered so by clay, marl, and "Yarmouth muck." The arable parts are here spoken of.

THE FLEG
HUNDREDS.

But there are in these hundreds large tracts which are covered with water, or occupied by reed and other aquatics; and others which are frequently overflowed in winter, but afford in summer extensive marshes, or grazing-grounds, for lean Scots and young cattle.

Those are another source of riches to the arable lands; on which the marsh-stock is kept, and generally fatted on turneps, during the winter months; besides great quantities of manure being also raised from sedge and other litter cut out of these fens and marshes.

THE FLEG
HUSBAN-
DRY.

We called upon Mr. Ferrier, of Hemsby, who occupies his own estate, and is universally acknowledged as one of the best farmers in
"Fleg."

“Fleg.” He very obligingly shewed me his farm, and favoured me with a recital of his practice.

106.

FLEG HUS-
BANDRY.

The Fleg farmers, it is true, get amazing crops; they reckon from ten to twelve coomb of wheat, and fifteen to twenty coomb of oats, an acre, no very extraordinary produce: but when we learn that crops like these are produced from the succession, or from any management nearly resembling the succession, of wheat, barley, clover, wheat, oats, wheat; every person conversant in farming must exclaim, that the soil which will bear such treatment is extraordinary indeed; more especially when he is told, that the crop of wheat which follows the oats is generally better than that which preceded them; the oat-crop being thrown in as a damper of the raging fertility of the soil.

Mr. Ferrier, who is a very sensible, judicious, plain farmer (though formerly a sailor) having observed that wheat after clover, or a summer fallow, became too rank to stand, and ran too much to straw to yield a large produce of grain, ingeniously contrived this intervening crop of oats, in order to correct the over-abundant fertility or rankness of the soil; and in this his
supe-

106.
SUMMER
FALLOW.

superiority of management seems principally to consist. He seems to consider a summer fallow as the most dangerous process that can occur upon a farm; for the wheat crop which succeeds it he has found invariably spoiled through an over-rankness; and what appears much more extraordinary, the barley crop which follows the wheat is in this case generally too small; owing, as Mr. F. supposes, to the wheat having too much impoverished the soil: this however does not accord with the practice of wheat; oats, wheat. I have no doubt of Mr. F.'s veracity, or of the fact, but apprehend it is produced by some other cause than the poverty or exhaustion of the soil.

FLEG SOIL.

Mr. Ferrier's soil is principally a rich dark-coloured loam, except one piece or two, which are of a more sandy nature. A piece near his house is peculiarly fertile: he never knew it to fail producing a valuable crop. A recently-made ditch gave me an opportunity of examining it. It is one uniform mass of rich black loam, for more than two feet deep; and under this lies a brick earth; a soil, this, capable of producing madder, woad, hemp, or any other vegetable of our climate which requires a rich deep soil. The principal part of his estate,
how-

however, is of a much shallower soil, not deeper than the plow goes; and its present very amazing fertility he ascribes in a great measure, to his having *clayed* it. Indeed to this species of improvement the fertility of the Fleg Hundred is allowed to be principally owing.

Mr. F. gave me an opportunity of examining his clay-pit; which is very commodious; the uncallow is trifling, and the depth of the bed or jam he has not been able to ascertain. It is worked, at present, about ten or twelve feet deep.

The colour of the fossil, when moist, is a dark-brown, interspersed with specks of white; and dries to a colour lighter than that of fuller's earth; on being exposed to the air it breaks into small die-like pieces.

From Mr. F.'s account of the manner of its acting, and more particularly from its appearance, I judged it to be a *brown marl*, rather than a *clay*; and, on trying it in acid, it proves to be strongly calcareous; effervescing, and hissing, more violently than most of the *white marls* of *this* neighbourhood: and what is still more interesting, the *Hemsby clay* is equally turbulent in acid, as the *Norwich marl*; which is

106.
FLEG CLAY.

106.
FLEG CLAY.

brought, by water, forty miles into this country, at the excessive expence of four shillings a load upon the staith; besides the land-carriage. (But see MARL, Vol. I.)

It is somewhat extraordinary that Mr. F. sensible and intelligent as he is, should be entirely unacquainted with this quality of his clay; a circumstance, however, the less to be wondered at, as the Norfolk farmers, in general, are equally uninformed of the nature and properties of marl.

The quantity set on by Mr. F. was about forty middling loads an acre, about twenty years ago:—it is now beginning to wear out; and he is of opinion his land will not bear elaying a second time.

For want of mould he is sometimes obliged to use some clay for the bottoms of his dung-hills; but he does not much approve of it, preferring good mould when he can get it.

THE FLEG
WORKMEN.

The Fleg farmers are noted for their quick dispatch of business; and for the great quantity of work they get done by a given number of servants and labourers. Mr. F. made the observation, which is corroborated by Mr. E. (formerly of Fleg) who gives for instance, that he has had twenty loads of tough sedgy muck

muck filled, daily, by a common day-labourer!

106.

FLEG SOIL,

Mr. Ferrier gave a striking instance of the fertility of the Hemsby soil. He has known a farm driven by a beggarly tenant, who has been succeeded by another, who has still continued to drive it; yet, after all, it has retained its prolific qualities; and has still continued to throw out abundant crops; especially if a full crop of *clover* can be obtained; a thing which Mr. F. speaks of as an improvement almost equal to that of a coat of muck.

CLOVER.

Mr. F.'s management of his *turneps* is very judicious.—He begins with those which lie farthest from home; throwing them abroad in the adjoining stubbles and lays; but in winter he brings his cattle into the yard; which is a very convenient one; and is, I believe, esteemed the first in the country.

TURNEPS
IN FLEG.

It consists of a large square: on one side of it stand the barns; and, on the opposite side, a long range of troughs or mangers; behind which is a gangway for the feeder; and behind this (out of the yard) the turnep-house.

The turneps are tailed, and freed from the principal part of the dirt, and put into the troughs entire; which Mr. F. esteems, upon

106.

TURNEPS
IN FLEG.

the whole, a better practice than chopping them.

The troughs stand on the highest side of the yard, upon a rising ground; so that the bullocks always stand clean to feed, while the urine settles down among the straw in the lower parts of the yard.

The posts which support the manger run up fence-height, and have a single rail passing from one to another, to prevent the bullocks from clambering over the troughs. (A shed under which the bullocks could feed and lie down warm and comfortable in rainy cold weather, would be a great improvement to this yard).

Turneps being now run up to blossom—Mr. F. mows off the tops with a fithe, giving these alone to his fattening bullocks; while his cows and lean stock have the bottoms given them entire. This judicious management has two good effects: the bullocks instead of receiving a check, as they are apt to do, when turneps are in this state, are pushed on, perhaps, faster than when the bottoms are in full perfection; and the stock-cattle, by not having had a taste of the tops, eat up the bottoms the cleaner.

How

How much preferable is this management to that of his neighbour 'Squire ———, who having turned twenty fine bullocks into a close of charming turneps, (such as would have been worth in this part of the country three or four pounds an acre) they have licked off the blossoms, and the better parts of the tops, and are now pining over the stalks and bottoms.

106.

TURNEPS
IN FLEG.

This piece of turneps, as well as the remains of Mr. Ferrier's, and the other remaining pieces in the neighbourhood, shew what noble crops of this valuable root are grown in the Fleg Hundreds.

These and a thousand other circumstances are undeniable proofs of the richness of the Fleg soil: whilst the universal foulness which overruns the crops of wheat and clover are proofs equally evident of the *uncleanliness* of Fleg farmers: from our leaving Happisbro', Hempstead, &c. until our return to Stalham and Brunstead, we saw very few pieces either of wheat or of clover which did the owners any degree of credit.

FLEG SOIL.

FLEG HUS-
BANDRY.

Fences. In this necessary piece of husbandry the Fleg husbandmen excel; while the hedges of Happing and Tunstead, either from the nature

HEDGES
IN FLEG.

106.

HEDGES
IN FLEG.

of the air and soil, or from mismanagement, or *perhaps* by *old age*, are greatly below par; the fences being mere mud-walls, with here and there an old stunted thorn. Near the coast the sea air may have some influence; but in Fleg, equally near to the sea, the hedges are flourishing and beautiful in a high degree. The Fleg farmers seem fully masters of the subject of live hedges. They plant the layer at a moderate height, and are aware of the utility of cutting it down to the stub at four or five years old; facing and backing the ditch, and setting on a new hedge. This secures them a fence in perpetuity; for before the second dead hedge begins to fail, the quick is become a perfect fence. Another good practice is that of trimming off the young shoots which sprawl over the ditch; by which means their hedges become thick at the bottom. Add to this, they do not suffer their quick to stand too long before they cut it down to the stub; so that an old overgrown hedge, or row of timber-like "bulls," is scarcely to be seen. Their method of felling them, too, is much preferable to the practice of this part of the country; where the stubs are usually cut off smack-smooth with the face of the bank, and

many

many of them frequently buried in it, so as to be totally destroyed: whereas, in Fleg, the stubs, universally, whether young or old, stand six or eight inches out of the face of the ditch; by which means a number of shoots is produced. The lately raised fences have most of them furze growing on the backs of the banks.

Feeding wheat. Throughout the journey, the wheat appeared to be almost universally fed by stock of every denomination; sheep excepted; of which stock we did not see a score either in the Happing or the Fleg Hundreds! but calves, young stock, cows, and even fat bullocks, and horses, were still to be seen in almost every close of wheat we passed. The spring of this year, however, is remarkably late; the turneps are gone, and the grass not yet come to a bite; so that wheats, this year, are more universally fed, and fed later, than perhaps was ever known. Mr. Ferrier seems almost the only exception to the practice: he never feeds his wheat, from a general idea that "the first fruits are the best."

It is observable, that let the Norfolk soil be ever so strong, it is not stubborn; and let it be even soddened by heavy rains, and rendered cold

106.

HEDGES
IN FLEG.FEEDING
WHEAT.

SHEEP.

THE SOIL OF
NORFOLK.

106.

NORFOLK
SOIL.

and livery by laying flat, it is no sooner exposed to the air than it becomes mellow and friable. This peculiar quality is said to be principally owing to marl (or clay); by the fertilizing quality of which, land that is sufficiently strong for wheat, is rendered sufficiently tender for turneps and barley. Before the use of marl and clay the Fleg farmers could not grow turneps; whereas now they excel in that valuable crop. Mr. Ferrier, in one of the stiffest of his pieces, put his toe upon a clod to shew me this excellent property; and with a slight pressure of his foot burst it to an almost impalpable powder. This friability of strong land is, perhaps, one of the best criterions of a good soil.

FARMERS.

Mr. *Brague*. The character of this man is so very extraordinary, that I cannot refrain from sketching some of its principal features. He was, I believe, bred in the army; served some time in the militia; has fought two or three duels; quarrelled with most of the gentlemen of the county; and, coming to a good paternal estate, discharged his tenants and commenced farmer.

He is now an occupier of 1700*l.* a year—yet he has neither steward nor even bailiff to assist him;

him; no wonder, then, he abuses and receives abuse from his work-people; or that he sometimes frightens them away; his harvest, perhaps, standing still, until his neighbours have finished. He attends fairs and markets—sells his own corn and his own bullocks; and even finds time to attend to the taking in gist stock upon a very extensive marsh—and this without any assistance; save that of his lady, who keeps his accounts.

My fellow-traveller being acquainted with him we rode through his farm-yard, and found him looking over some young cattle which had been brought up for his inspection. His person is gross and his appearance bacchanalian—his dress that of a slovenly gentleman.—There is a politeness in his manner; and his conversation bespeaks a sensible intelligent mind; borne away, however, by a wildness and ferocity which is obvious in his countenance, and discovers itself in every word and action. Nevertheless, it is said, that, in a polite circle, Mr. B. can excel in politeness.

The parish of Waxham is principally in his own hands; and the adjoining little parish of Horsey is entirely in his occupation.

The country round him is exceedingly flat and low, being nearly on a level with the sea at high-

106.

FARMERS.

106.
FARMERS.

high-water, and defended from it only by the Marram Banks, which are broken into gaps at every two or three hundred yards; so that in stormy weather the sea rushes through, and frequently does considerable damage by overflowing the country. Mr. B. told us, that he had four acres of very fine cole-seed swept down during the late tempestuous weather.

His land, however, which lies out of the water's way, is rich and fertile in a high degree; and Mr. B. it is said, gets exceedingly fine crops from it; so that it is probable, notwithstanding the irregularity with which his affairs are conducted, and that want of attention to minutiae which must necessarily occur in such a boundless scene of business, Mr. B. does not injure his fortune by farming; for it seems generally allowed that no farmer gets his work done *so cheap* as Mr. B.

MARRAM
BANKS.

Marram Banks. The country towards the coast from Happingsbro' to Winterton, about ten miles, is a dead flat; and, to the eye, appears to lie lower than the sea at high water. By the side of the beach runs a range of broken, irregular hillocks, from five to fifteen or twenty feet high, and from fifty to upwards of a hundred yards in width at the base; composed

posed entirely of sea sand; which, in some places, is pretty well overgrown, and bound together by a rush-like vegetable called, in that neighbourhood, "marram" (the *arundo arenaria* of LINNÆUS) which the poor people cut and sell for thatch.

These hillocks, however, do not serve the purpose of a secure embankment against the sea; they being, in many places, divided down to their bases, by sluices of different widths; namely, from five to fifteen or perhaps twenty yards wide. Through these inlets, in boisterous weather, and with an easterly wind, the sea rushes, and overflows the country.

The hills have a picturesque, though dreary appearance, and afford a romantic ride:—the traveller may in general pass either on the beach or the land side; winding through the openings at pleasure.

The manner in which these banks have been originally formed appears at first sight mysterious: how the sand should be blown up into heaps, and not scattered flat over the face of the adjoining country, seems inexplicable. The marram, it is true, may have assisted; but this, alone, seems unequal to the task.

Until we had passed Mr. B—e's marshes, the
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beach lay open to the country ; so that the stock have free egress to the sea ; on the edge of which they delight to lie in the heat of the summer ; when they lie cool and free from the flies, with which the marshes are greatly pestered. But, having passed Mr. B——'s grounds, the proprietors of the next marshes are under the necessity of fencing against the beach ; lest their cattle should stray into Mr. B——'s liberty, who is lord of the manor.

This is done by placing rows of faggots in the gaps, between the sand-hills ; which, being steep on the side towards the sea, are of themselves a fence,

The effect of these faggot-fences are striking ; for the sand being blown upon the beach in a similar manner to snow, it drifts in the same way ; and, in some places, the tops of the faggots are only to be seen ; the sand having drifted on both sides ; more particularly on the side towards the country ; so that the cattle might now almost walk over them : and it strikes me very forcibly, that from fences, to keep the marsh cattle from straying away upon the beach, have originated the Marram Banks.

But whether this is the fact or not, I am fully convinced that by faggots, or some other
more

more substantial fencing, Marram Banks might, at a trifling expence, be converted into a barrier not to be broken by the sea: for, notwithstanding the long and violent easterly winds which have lately blown, such as to violence and continuance has scarcely been known before, there is only one place in which the sea has been able to move even these bramble-faggots; and this has happened in a gap which is wider than ordinary: the faggots, here, being forced out and scattered over the marshes.

From the cursory view I have had, the most eligible way of joining the hillocks, so as to form a regular embankment, seems to be this:—Make a double fence in each gap; placing the two fences at, perhaps, twenty or thirty yards distance from each other; or, more generally speaking, at five to ten yards within the skirts of the present bank. As soon as the hollow space between the first pair of fences be filled up with sand, raise another pair, a few yards within the first; and above these another, and another, until the gap be filled up, or be raised to a sufficient height; and then, on the top, propagate the marram plant.

Two rows of faggots might be sufficient for the narrow gaps; and for the larger ones shipwreck,

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wreck, or other old ship-timber, might be used; more especially for the foundation course.

If the sea should hereafter gain upon the banks, so, as, in process of time, to endanger the whole, raise a fence on the land-side at some distance from the old banks, to catch the sand blown over them; and thus from the wreck of one embankment another might be raised, and the country kept in perpetual safety.

Mr. B——e has attempted to make the embankment a public matter; but has not succeeded. It strikes me, however, that it would be well worth his while to defend his own coast at his own expence: but he says, “It is not for me to attack the German Ocean single-handed.”

GEN. MAN.
OF ESTATES.

Mr. Anson has hit off a very great improvement upon his estate near Yarmouth.

On the Suffolk side of the river, opposite the Key of Yarmouth, were some low grounds, let, I believe, as marsh-land. These grounds have lately been divided into lots, and let on building leases of ninety-nine years, at the greatly improved rent of seven pounds an acre; besides the advantage which will accrue at the expiration of the term.

Such

Such a stroke as this is a *real* improvement of an estate; and there are few extensive estates which will not, if properly attended to, admit of being advanced, without sending the farmer to jail, or the cottager to the poor-house.

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MAY 12. WORSTEAD FAIR.—This fair is held on Old May-Day, and is called “May Fair.” It has for many years been noted for fat bullocks. This year, however, there were not more than a hundred bullocks in the fair, and not twenty of those which were *fat*. There were about three hundred head of cattle; chiefly two-year-olds, and cows and calves, with some few buds.

MARKETS.

The Norwich butchers were the principal chapmen for bullocks.

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MAY 17. Last year,—to render my residence more commodious, as well as to gain some information on the subject of cheese-making—an art I was then a stranger to—I rented a small dairy of cows. I took them the rather as I had then in my service an excellent

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cellent Wiltshire dairy-woman; who, I was in hopes, might be able to make some improvement on the Norfolk method of making cheefe; which, I had been given to understand, was execrable.

Having long considered this interesting subject as being allied to experimental philosophy, I placed it in that light, and paid as much attention to the different processes as an active scene of employment would permit me.—What I have been able to do is only an essay; but it is sufficient to convince me, that with leisure and application, much might be done towards bringing this, at present mysterious, but important subject to some certain and fixed principles.

In registering the information I have been able to obtain, it will be proper to digest it under the following heads:

1. The preparation of the rennet.
2. The coagulation of the milk.
3. The management of the curd. 219
4. The management of the cheefe. 226

1. *Rennet.* The curd which happens to be contained in the stomach of the calf when butchered, together with the hairs and dirt which are inseparable from it, are used by the dairy-

dairy-women of *this* country to coagulate their milk : hence, probably, the rancid flavor of the Norfolk cheese ; perfectly resembling in scent the *parent* curd ; and *this*, as nearly as may be, *its more matured self*.

The rennet which I made use of was prepared in the following manner.

Take a calf's bag, maw, or stomach ; and, having taken out the curd contained therein, wash it clean, and salt it thoroughly, inside and out, leaving a white coat of salt over every part of it. Put it into an earthen jar, or other vessel, and let it stand three or four days ; in which time it will have formed the salt and its own natural juices into a pickle. Take it out of the jar, and hang it up for two or three days to let the pickle drain from it ; resalt it ; place it again in a jar ; cover it tight down with a paper pierced with a large pin ; and in this state let it remain until it be wanted for use. In this state it ought to be kept twelve months : it may however, in case of necessity, be used a few days after it has received the second salting ; but it will not be so strong as if kept a longer time.

To prepare the rennet for use ; take a handfull of the leaves of sweet-briar,—the same

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quantity of the leaves of the dog rose, and the like quantity of bramble leaves; boil them in a gallon of water, with three or four handfulls of salt, about a quarter of an hour; strain off the liquor, and, having let it stand until perfectly cool, put it into an earthen vessel, and add to it the maw, prepared as above. To this is added a sound good lemon, stuck round with about a quarter of an ounce of cloves; which give the rennet an agreeable flavor.

The longer the bag remains in the liquor, the stronger of course will be the rennet: the quantity, therefore, requisite to turn a given quantity of milk, can only be ascertained by daily use and observation.

When the rennet is sufficiently strong take out the bag; hang it up two or three days for the rennet to drain from it;—resalt it;—put it down again into the jar; and thus continue to treat it, until its virtues are exhausted; which will not be until it has been used several times.

By suffering one or more bags to remain in the liquor, the rennet thus prepared may be raised to a very high degree of strength, as will appear in the following observations.

The leaves and the spice, it is probable, have no other effect than that of doing away the

the ill flavor of the maw; which, if ever so well cleaned, retains a faint disagreeable smell; whereas the rennet prepared as above, is perfectly well flavored.

It is, however, I find, an idea among the Wiltshire dairy-women, that the leaves correct any rankness or evil quality in the milk, arising from a rankness of pasture: they being further of opinion, that different pastures require different sorts of herbs to correct them; and some of them, it seems, are, or pretend to be, so deeply versed in this art, that they will undertake to correct any milk, so as to prevent the rising "heaving" or "blowing" of the cheeses made from it; and, consequently, the rancidness which usually accompanies a porous cheese.

This is, no doubt, a grand object of cheese-makers; but it is not, I apprehend, to be obtained by so small a proportion of vegetable juices as pass with the rennet into so large a proportion of milk. Nevertheless, it appears to me highly probable, that this grand desideratum lies within the reach of the chemical art; and that, by a course of judicious experiments, some vegetable or mineral preparation, adequate to this valuable purpose, may be discovered.

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2. *Coagulation.* Next to the art of correcting the milk (an art as yet in its infancy) this seems to claim the attention of the experimentalist.

It is known, from daily experience, that the warmer the milk is, when the rennet is put to it, the sooner it will coagulate, with a given quantity of rennet of a given strength.

It is equally well known that the cooler the milk, and the longer it is in coagulating, the more tender and delicate the curd becomes: on the contrary, if the milk be too hot, and the coagulation takes place too rapidly, the curd proves tough and harsh.

But it seems to be a fact, equally well established, that a cheese made from milk, which has been coolly and slowly coagulated, is longer before it become marketable than one made from milk which has undergone a less deliberate coagulation; and which, being drier, and of a harsher texture, sooner becomes "cheefey," and fit for the *taster*.

Therefore, the great art in this stage of the process lies in—

The degree of warmth of the milk when *set*; that is, when the rennet is put to it; or, in—

The

The degree of heat retained by the curd when it *comes*; that is, when the coagulation has sufficiently taken place; or, in—

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The length of time between the *setting* and the *coming*. Which length of time may be regulated either—

By the degree of the warmth of the milk when set; or—

By the state of warmth in which it is kept during the time of coagulation; or—

By the quantity and strength (taken jointly) of the rennet.—

To endeavour to gain some information on this subject, I made the following observations.

1781. *June 5.* Twenty-three gallons of milk, heated to ninety-six degrees of Farenheit's scale, with two tea-cup-fulls of weakish rennet, came in one hour; the curd delicate and good.

June 6. The same quantity of milk, of the same heat, with the same quantity of rennet, came in nearly the same time; the curd somewhat tough; owing, probably, to the milk having been "burnt to the kettle" in which it was heated.

June 7. Twenty-seven gallons of milk, heated to ninety-four degrees, with the same quantity of rennet, came in about two hours; the curd very good.

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June 8. Twenty-six gallons of milk, heated to one hundred and two degrees, with one tea-cup-full of rennet, came in two hours and a half; curd very good,

June 9. Twenty-five gallons of milk, heated to one hundred degrees, with a tea-cup-full and a half of rennet, came in about one hour and a half; the curd good, but somewhat tough; owing, perhaps, to the milk being kept too warm in the cheese-tub, by being covered up close with a thick cloth.

Note, On the seventh and eighth, the whey retained a heat of about eighty-eight degrees, whereas the whey this morning was ninety-two degrees: so that, perhaps, it is not the heat when it is *set*, but the heat when it *comes*, which gives the quality of the curd.

June 10. Twenty-five gallons: ninety-six degrees: two cups: uncovered: came in two hours and a quarter: whey eighty-seven degrees: curd very tender.

June 11. Twenty-three gallons: one hundred degrees: more than a tea-cup: uncovered: did not come in two hours; owing to the rennet being lower in strength than before: therefore, added in a little more rennet; which brought it in about three hours from first setting:

ting: the whey eighty-seven degrees: the curd uncommonly delicate.

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June 12. Twenty-four gallons of milk: one hundred degrees: two cups of rennet: uncovered: came in two hours: whey eighty-nine degrees: curd uncommonly tender.

June 13. Twenty-eight gallons of milk: ninety-two degrees: three cups (say strongly renneted): covered up with a coarse linen cloth: came in one hour and a half: whey eighty-six degrees: curd very good, and of a very fine colour; though perhaps would have handled tenderer, if it had not stood some time after it came before it was broke up.

Perhaps much depends on its being broke up in the critical minute.

June 14. Twenty-eight gallons: one hundred degrees: two cup-fulls: uncovered: came in one hour and a quarter: whey ninety-four degrees: curd somewhat harsh, but of a good colour.

The change of colour is therefore owing to the change of pasture.

Note, The milk should be covered to make it come together:—this came and grew hard at the bottom, half an hour before it was set at the top.

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June 15. Twenty-eight gallons : milk heated to ninety-five degrees : with two cups of rennet; and covered after it had stood three quarters of an hour : came in one hour and a half : whey eighty-nine degrees (the morning warm): curd very good and tender.

June 16. Thirty gallons of milk : heated to one hundred and three degrees ; but lowered by two pails-full of cold water to ninety-six degrees ; with two cups and a half of rennet ; and kept close covered : came in one hour : whey ninety-four degrees : curd pretty good ; but not sufficiently tender.

June 17. Twenty-eight gallons ; ninety-seven degrees : two and one-half cups : covered ; but not close : came in one hour and a half ; whey not tried : curd somewhat tough.

Note, the toughness is owing, perhaps, to some milk of a new-calven cow being among it.

Note also, to try the exact heat of milk immediately from the cow, immersed a dish in the pail while milking. After it had lain long enough to receive a degree of heat equal to that of the milk in the pail, emptied it, and immediately milked into it from the teat (the cow being

being at this time about half milked); the heat
ninety-five degrees.

Note also, the cheefes of yesterday (the
16th of June) prefs remarkably elastic, and
spungy (like a fungus): *perhaps* owing to the
milk's coming too hot; or *perhaps* to two or
three of the cows being then a-bulling*; or
perhaps, being made thicker than usual, the
prefs was not heavy enough for them; or *per-
haps* this ill quality is owing to the cold water
being put into the milk.

June 18. Thirty gallons: ninety-five degrees:
covered: came in one hour and a half: whey
ninety-two degrees: curd pretty good.

June 19. Thirty gallons: ninety-two degrees:
two cups covered: curd very good.

June 21. Thirty gallons: ninety-eight degrees;
lowered by half a pail of cold water to ninety-
five degrees: the curd good; but the cheefes
like those of the 16th prefs, hollow and
spungy.

* I afterwards found that the milk of a cow, on the day
of amour, retained, after having stood some time in the
pail after milking, ninety-eight degrees of heat. This shews
that the state if not the quality of the milk is altered by the
heat of the cow; and a cautious dairy-woman always en-
deavours to keep such milk out of her cheefe-tub.

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Therefore, it is *probable*, from these two incidents, that lowering the heat of the milk, with cold water, has an evil effect.

June 23. (Evening) Fifteen gallons of new milk warm from the cow, retaining a heat of ninety-two degrees, with two cups and a half of new weak rennet, and closely covered, came in three quarters of an hour: whey eighty-eight degrees: curd very delicate and good.

June 25. Forty gallons of *half-skim* milk, heated to eighty-seven degrees, with three cups of rennet, slightly covered, came in three quarters of an hour: whey seventy-nine degrees: curd remarkably good of *this* sort.

Sept. 8. In observing the effect of some remarkably strong rennet, I found that an ordinary tea-cup-full coagulated sufficiently upwards of forty gallons of milk, heated to only eighty-eight degrees, in thirty-five minutes.

From these observations it appears, that curd of a good quality may be obtained from milk heated from 87 to 103 degrees of Fahrenheit's thermometer; provided the rennet be so proportioned, that the time of coagulation be from three quarters of an hour to two hours and a half; and provided the milk be kept *properly* covered during the process of coagulation.

And

And from these as well as from a variety of other observations, which I made in the course of the summer, but which are not minutely, it appears to me, at present, that from 85 to 90 are the proper degrees of heat; that from one to two hours is the proper time of coagulation; and that the milk ought to be covered so as to lose in the process about 5 degrees of its original heat.

But climature, seasons, the weather, and the pasture, may require that these bounds should sometimes be broken. A few observations, made in one season, and in one place, how accurately soever they may have been taken, are by no means adequate to the entire illustration of this very abstruse subject.

3. *The curd.* — In Norfolk this stage of the process is very short. Part of the whey being laded off, the remainder, with the curd, is poured into a cloth:—the whey drains through; the curd is shook in the cloth; kneaded down into a vat; put under a light press, or perhaps under a stone; the cloth once changed; the curd once turned; and lo! a Norfolk cheese appears. The cows are milked and the cheese completed in ten or twelve hours.

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The practice in my dairy has been uniformly this.—As soon as the curd is come at the top, firm enough to discharge its whey, the dairy-woman tucks up her sleeves, plunges her hands to the bottom of the vessel; and, with a wooden dish, stirs the curd and whey briskly about: she then lets go the dish, and, by a circular motion of her hands and arms, violently agitates the whole; carefully breaking every part of the curd; and, at intervals, stirs it hard to the bottom with the dish; so that not a piece of curd remains unbroken larger than a hazelnut. This is done to prevent what is called “slip-curd” (that is, lumps of curd which have slipped unbroken through the dairy-woman’s hands), which, by retaining its whey, does not press uniformly with the other curd, but in a few days (if it happen to be situated toward the rind) turns livid and jelly-like, and soon becomes faulty and rotten. This operation takes about five or ten minutes; or, if the quantity of curd be large, a quarter of an hour.

In a few minutes the curd subsides, leaving the whey clear upon the top. The dairy-woman now takes her dish, and lades off the whey into a pail; which she empties into a
milk-

milk-lead to stand for cream, to be churned for whey butter*.

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Having laded off all the whey she can, without gathering up the small pieces of loose curd floating near the bottom of the vessel, she spreads a straining-cloth over her cheese-tongs, and strains the whey through it, returning the curd retained in the cloth into the cheese-tub. When she has got all the whey she can, by pressing the curd with her hand and the lading-dish, she takes a knife and cuts it into square pieces, about two or three inches square. This lets out more of the whey, and makes the curd handy to be taken up, in order to be broken into the vats †.

* This is a practice peculiar to the cheese counties, and forms no inconsiderable part of the profit of a dairy in those counties. In Norfolk, the whey, even from new milk, passes from the cheese-vessels immediately to the hog-tub.

† A dairy should be plentifully furnished with vats, and some of them of different sizes; for when three or four cheeses are made at each meal, a number of vats become actually in use; and if there are not still a number empty, the dairy-woman becomes confined in her choice, and cannot proportion exactly her vats to the quantity of curd she *happens* to find in her cheese-tub; and keeping a little overplus curd from meal to meal frequently spoils a whole cheese.

Having

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Having made choice of a vat or vats, proportioned to the quantity of curd, so that the cheese, when fully pressed, shall neither over nor under fill the vat, she spreads a cheese-cloth loosely over the vat; into which she re-breaks the curd; carefully squeezing every part of it in her hands; and, having filled the vat heaped up and rounded above its top, folds over the cloth, and places it in the press*.

In autumn, when the weather got cool and moist, the curd was *scalded*, “to make the “cheese come quicker to hand,” (that is, sooner saleable) and to prevent a white woolley coat from rising. It is done thus: If from

* Much depends on the construction and power of the press. The excellency of construction depends upon its pressing level: if it has too much play, so as to incline and become tottering or leaning one way or another, and do not fall perpendicular upon the cheese-board, one side of a cheese will frequently be thicker than another; and, what is still worse, one side will be thoroughly pressed while the other is left soft and spongy. Its power may be given by a screw, by a lever, or by a dead weight, and ought to be proportioned to the thickness of the cheese.

I had one constructed on the above principles; the power, a dead weight of stones, contained in a cubical box, moving in grooves so as to keep its bottom horizontal; the medium weight, 1 cwt. 2 qrs. but regulated, by the stones, agreeably to the thickness of the cheese or cheeses to be pressed.

new

new milk, scalding water (boiling water with a small quantity of cold whey mixed with it) is poured over the whole surface of the curd as it lies at the bottom of the cheese-tub : If from skimmed or other inferior milk, the out-sides only are scalded, after the curd is in the vat, by first pouring the scalding water on one side, and then, turning the cheeseling, pouring it on the other. For if in this case the *curd* were to be scalded, it would render it hard, and spoil the taste and texture of the cheese. In scalding the *cheeseling*, the curd is first put into the bare naked vat, and the upper part scalded : the cheese-cloth is then spread over it, and the vat being turned, the curd falls into the cloth : the curd, with the cloth under it, is then put into the vat ; the outer edges pared off ; the parings broke, and rounded up in the middle ; and the scalding water poured upon it as before ; the folds of the cloth laid over, and the vat set in the press.

The whey, being pretty well pressed out, and the cheeseling (whether it has been scalded or not) having got firm enough to handle, which it will be in about half an hour, the dairy-woman takes it out of the vat ; washes the cloth in a pail of clean cold water ; spreads
it

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it over the vat; turns the cheeseling upon it; squeezes it gently into the vat; folds over the cloth; tucks in the corner with a wooden cheese-knife; and replaces the vat in the press.

Supposing the cheeseling to be made in the morning, it now remains in the press, untouched, until the evening; when it is taken out, *salted*, put into a fresh dry cloth, and left in the press all night.

The method of salting is this:—The salt being well bruised, and the lumps thoroughly broken, it is spread plentifully on each side of the cheeseling, so as wholly to cover it, about one-tenth of an inch in thickness, more or less, in proportion to the thickness of the cheese. If this be of a considerable thickness, as suppose three inches and upwards, some salt is put into the middle of it, by stopping when the vat is half filled with curd, strewing on the salt, and on this putting the remainder of the curd.

Next morning, if the curd be rich, or has been cold-run, the cheeseling is turned into another dry cloth, and left in the press till evening: but if on the contrary the curd be from poor milk, or from milk which before
setting

setting had acquired any degree of sourness, or if it has been run hot and quick, the cheesling should in the morning be "bare-vatted;" that is, be put into the vat without a cloth round it, and be put again into the press until evening.

The use of bare-vatting is to take out the marks of the cloth; and thereby evade a waste of labour in bringing the cheese to a smooth glossy coat. The reason for the above distinction is, therefore, obvious; for the harder the curd, the longer the marks of the cloth are in pressing out.

In the evening, that which was turned into the dry cloth in the morning, is now bare-vatted; and that which was bare-vatted in the morning, is now turned in the vat; and, having stood in the press until morning, the process is finished. The *cheeses* are taken out of the vats, and placed upon the shelf.

Thus, supposing the cheesling to be made on Monday morning, seven o'clock, it is, between eight and nine, taken out of the vat; the cloth washed; and immediately placed in the press again. On Monday evening, it is salted and, if wanted, pared*; put into a dry

* A cheesling should never, in strict propriety, be pared after it has been bare-vatted.

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cloth ; and replaced in the prefs. On Tuesday morning it is bare-vatted, or the cloth changed ; the cheefling, in either case, being turned, and again put into the prefs. On Tuesday evening it is again turned ; and on Wednesday morning finally taken out of the vat and prefs.

4. *The cheefe.*—The objects of this most laborious department of cheefmaking are, to preserve the cheefe *sound* in itself, and to give it such an *appearance* as will recommend it to a purchaser.

Cheefes newly made, naturally acquire a white scurfy coat ; which, besides hiding, if not causing, the defects of the cheefe, is at least unfightly, and is a certain mark of the slovenliness of its maker. This scurf arises more plentifully on a poor than on a rich cheefe. Cold moist weather encourages it ; but, in warm weather, the oily exudation of a rich and well-made cheefe goes near of itself to eradicate the *white*, and bring on that desirable *blue* coat, which is at once a criterion of the goodness of the cheefe and of the skilfulness of the dairy-woman.

The Norfolk dairy-woman, however, pays little regard to appearances ; and, to speak truly of her, is equally ambitious to please the eye
and

and the palate. Her method is this:—the cheese (or rather as yet a bundle of curd) being taken out of the press, is salted upon a large earthen platter, in the same manner a piece of beef or pork is salted; and, having lain some time in salt, it is put upon a shelf to dry and stiffen.

Being in a manner unpressed; never cleaned; and but seldom turned; it is no wonder, that in a short time the white scurfy coat gets full possession of it; or that its surface should appear bloated and wrinkled; or that its rind should be divided by innumerable fissures; or that its appearance, altogether, should be that of a sugared plumb-cake, rather than of a cheese.

However, with respect to appearances, the Norfolk dairy-woman may plead in excuse that her customers are familiarized to the *sights* which she prepares for them: but when she follows a practice which subjects her produce, if not sold off while yet in an unripe state, to almost inevitable destruction, she is highly culpable.

Cheeses made in this country are attacked by an enemy little dreaded, or wholly unknown, in the cheese-counties; namely, a species of

Q 2

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maggot, whose unlimited mischievousness seems to be confined to this part of the kingdom.

The fly, which is the cause of this serious mischief, is of a species somewhat small, slender, black, and shining; very much resembling the small winged ant. Wherever it finds a crack or other defect in the rind, be it ever so minute, it turns its tail towards the aperture; and, by the insertion of a slender sheath not unlike the sting of a bee, there deposits its eggs. If the fissure be sufficiently large and deep, it enters its hind-parts also: if still deeper, it crawls backward into the cheese; leaving only its head in sight, and thus injects its eggs to a considerable depth.

As the maggots rise into life, they travel still farther into the substance of the cheese; and, if it happens to be porous, soon pervade every part of it; in a few weeks working its total destruction: for not only the parts they immediately inhabit, but the whole cheese becomes bitter, and entirely inedible; except by some of the good people of the country, to whom custom has rendered even the maggots grateful.

Last year (1781) being remarkable for flies of every species, there were, in this neighbourhood,

hood, many dairy-women who had not, even in September, one thoroughly sound new-milk cheefe in their dairies.

A remedy for this evil would be a valuable discovery to the East Norfolk farmer: for although East Norfolk is not properly speaking a dairy country, there are a great number of cows kept in it; not only for its home consumption of butter and cheefe, but for the purpose of rearing bullocks for the London market.

The only remedy practised here, in common, is to place in the cheefe-chamber large boughs, on which the flies settle. The boughs being loaded with flies, are taken into another room, and beaten upon the floor; by which means numbers may be destroyed; numbers, however, are still left behind; and while there is one fly in the room, a defective cheefe is not safe.

This mischievous animal, whether in its fly or maggot state, is very difficult to be destroyed, without actually crushing it. *By way of experiment*, shut up the cheefe-chamber as close as possible; and burnt in it not less than four or five ounces of sulphur; causing a fume powerful enough to have stifled an elephant;

Q 3

but

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but not a fly suffered by it.—*Again*, put a slice of cheese affected by the maggot, into some boiling water, immediately from the tea-kettle: let it lie a few minutes in the water: took it out and broke it: the maggots were, to every appearance, as much alive as if they had not been in the water!—It is in vain, therefore, to think of destroying the animal; for, although the fly may be easily killed by hand or otherwise, and, with a little pains, the dairy and cheese-chamber might for a moment be cleared; yet, from the numbers which are bred in the neighbourhood, the very air is filled with them; and the room, of course, presently replenished: therefore, the only way left of avoiding the loss is to endeavour to find out some means of defending the cheeses themselves against the attacks of these destructive enemies.

These means, I flatter myself, are fully pointed out in the practice I am now registering.

The first week or ten days, the new-made cheeses are carefully turned once a day; great care being had not to break the yet tender rind in turning; nor to suffer it to be cracked by

too free an admission of a dry, parching air.

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As soon as they are become firm enough to be handled with safety, they are cleaned in this manner: some skimmed whey being put into a milk-lead, or other broad, shallow vessel, so as to cover the bottom of it half an inch or an inch deep, the cheeses to be cleaned are taken from the shelf and placed in the whey. One side being thoroughly moistened, the other side is placed downward: the edges too are wetted with a cloth, so as to make the whole coat of the cheese soaking wet. The dairy-woman then takes a hard brush, and brushes every part of the cheese; frequently dipping her brush in the whey, to eradicate the white coat more readily and more effectually. This done, she places them again on the shelves; but before they be quite dry, while their coats are yet moist, she rubs them over with a cloth, on which a piece of whey, or other common, butter has been spread. This keeps the rind supple, and free from cracks; checks the scuffy coat from rising; and, by stopping the pores and fissures of the coat, prevents the fly from depositing her eggs. If the rind be rough, from the marks of the cloth or other cause, she scrapes them with a knife, or other instrument:

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this

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this last operation, however, is as yet performed with great care and delicacy.

Having thus washed and scraped them two or three times (in the course of about a week from the first cleansing) she removes them from the dairy-shelves into some spacious airy room, with a firm even floor, which she first rubs plentifully with green succulent nettles, so as to give it a temporary greenness, and then places her cheeses in rows upon the prepared floor. She now washes them no more; but, if the coat be yet rough, and the scurf continue to rise, she scrapes them more freely than before; and, as the rind gets harsh, softens it with butter; thus continuing to treat them, and still continuing to turn them once a day, until they acquire a rich golden polish, and the *blue coat* begin to shew itself.

This crisis, namely, the appearance of the blue coat, is not altogether regulated by the age of the cheese, but depends on its quality and the state of the weather. Perhaps it may appear before the cheese be one, perhaps not until it be more than two, or even three, months old; therefore, no certain number of cleanings can be fixed; these rules, however, may be observable: scrape and rub them, until they be

per-

perfectly smooth; mellow the rind with butter, whenever, for want of natural exudation, their coats get dry and harsh; thus continuing to keep them smooth yellow and glossy, until the blue coat begin to make its appearance, voluntarily; and then, but not before, begin to encourage the blue coat.

This ingenious process is thus conducted: Having rubbed the floor thoroughly with fresh nettles, the dairy-woman places such of the cheeses upon it as she judges to be ready for "coating;" and upon the top of each cheese puts three or four vine-leaves; or, for want of these, a cabbage-leaf. This, if the cheese be good, will in a day or two bring up the desired vestment: but an inferior cheese will take a longer time in coating; and as the leaves lose their greenness and succulence, she replaces them with fresh ones; and as she turns the cheeses, which is now done every second or third day, she re-covers the upper sides with leaves; but wipes their edges hard with a clammy cloth; so that the *edge*, and a narrow ring round each side, ever retain the polished yellow hue.

When the cheeses were properly coated, and their edges had got sufficiently firm, they were placed

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placed on edge in a cheese-rack *, and, without further care, (except once a week moving them a little round, and now and then wiping their edges) there remained until the time they were sent to market,—which was yesterday.

The soil from which these cheeses were made is a sandy loam, but lies cooler, and is of a better quality than are Norfolk soils in general.

The herbage principally rye grass (*Lolium perenne*), oat grass (*Bromus mollis*), and white clover (*Trifolium repens*), being principally new-lays of three to five years old.

* Cheese-racks save labour in turning,—collect the cheese into a small compass, - and put it out of the way of vermin. They may be variously constructed. The plate rack, with four or five tier one above another, seems to be the best form. If the cheeses be nearly of one size, the rack should be made the same width at the top as the bottom: but if they be of different sizes, it ought to be made narrower at the top than at the bottom; and if they be of different thicknesses as well as of different diameters, the spaces for the respective cheeses should likewise be varied. A small rack may be flung with a rope and pulleys at each end; so as be to drawn up and lowered down at pleasure: but a large one is difficult to fling, in a common room, in that manner; it ought therefore to stand on legs about two feet high, with a broad base-board projecting over the legs, so as to prevent vermin from climbing up into the rack. Mine was on the latter construction.

The

The *cows* of the Lancashire *breed**, and of different *ages*.

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The *cheese*, in quality and appearance, resembles very much that of inferior Warwickshire, or the two-meal cheese of Gloucestershire; being lean and dry, considering the species of milk; which was neat, or nearly neat, from the cow.

This inferior quality is probably owing, in a great measure, to the quality of the soil; and perhaps, in some degree, to the method made use of in separating the whey.

With respect to the *fly*, not one cheese in a hundred (after the mischief was first discovered) suffered from it. There cannot be a greater proof of the eligibility of the method in this case practised, than that of my being able to preserve the principal part of the dairy to a time when there is not, generally speaking, another Norfolk cheese in *this* part of the county †.

If

* That something considerable depends on the breed or *variety* of cow is evident from an experiment I made with the milk of the Alderney cow; the produce from which was of a texture almost as close and firm as bees-wax, and nearly as high-coloured; as different in quality and appearance from the produce of the long-horned cows, as if they were two distinct *species* of animals.

† On the Suffolk side of the county, about Harleston and

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If from one year's experience I might venture to dictate in the art of making cheese in Norfolk, it would be in this way.

1. To make use of a clean well-flavoured rennet.

2. To pursue the method now in use of separating the curd from the whey: for, although the method above described may be eligible on rich land (and is practised in the counties of Wiltshire, Gloucestershire, and Warwickshire), yet, on a leaner soil, it may be prudent to preserve as many of the butyraceous particles as possible in the curd, rather than to suffer them to escape from this, and pass through the whey into butter*; *provided cheeses of a sufficient contexture to secure them from the attacks of the fly, can be produced by the method of separating the whey now in practice in Norfolk.*

3. To let the cheeses remain in the press until they have acquired a sufficient degree of

and Dis, the method of making cheese partakes of the Suffolk practice; which, though *not celebrated*, is a degree above that of East-Norfolk.

* It is, however, observable in this place, that, in point of *net profit*, it is highly probable that the *certain* advantage arising from the butter would more than overbalance any *probable* advantage which the quality of the cheese would receive by retaining in the curd *a part* of this butter.

firm.

firmness, and their rind such a degree of toughness, that they may, on being taken out of the press, be safely handled, without danger of cracking.

4. To keep their coats supple and clean; the first, to prevent, as much as possible, their cracking afterwards in turning; and the latter, to discover with greater readiness, and to remedy with greater ease when discovered, any flaw which, through accidents or oversight, may happen.

5. If through accident or neglect the fly should be suffered to make an impression (which is easily discoverable by a dimple in the rind and its softness to the touch), cut out the part affected (perhaps not yet larger than a walnut), dust the wound with pepper, fill it up with butter, and close it with a piece of soft paper: thus forming an artificial rind, which will secure it from further injury, until it has acquired an age sufficient to recommend it to a purchaser.

By these rules, *I am of opinion*, that cheese of a middle quality as to richness, and secure against the fly, might be produced in East Norfolk; *provided the present method of separating the whey, will give the cheesing a sufficient degree of texture to be handled with safety* *.

* My doubts, respecting this matter, arise not more from

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If not, *I am certain*, that by adhering closely throughout, to the practice above registered, a *wholesome* good cheese, palatable to men in general, and *proof against the fly*, may be made in East Norfolk, with a great degree of certainty.

from the loose crumbly texture of Norfolk cheeses in general, than from the following practice; which, likewise, strengthens my apprehensions of the richness of the cheese in question being lowered by the curd having been broken too finely in the whey.

A gentlewoman, who lives in this neighbourhood; who pays a personal attention to her dairy, and whose abilities in matters of household are indisputable, says, that when she wishes to make a cheese of a superior degree of richness, for her own table, she takes the curd and whey out of the cheese-tub very gently, with a slecting dish (before they have been any way disturbed) and puts them immediately into the vat; upon which she places a broad hoop; by means of which she is able to pile up a sufficient quantity of this wheyey curd to fill the vat when pressed. She then folds over the cloth, and lets the press down upon it, very gently and gradually; so as to squeeze out the whey, and at the same time retain that rich milky liquor which is mixed among the curd, and which by much breaking before it be put into the vat, is lost among the whey. With care, she says, the whey may be drawn off quite green and clear; leaving the "buttery" particles behind in the cheese. By this means, she says, she has made cheeses which have tasted as fat as Gloucestershire cheese: but adds, that *great care is necessary in handling a cheese thus made; for if it crack; no pressing will ever close it again.*

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MAY 17. In the course of last summer I likewise paid considerable attention to the art of making butter; registering, at the time of observation, the minutiae of the different processes.

BUTTER.

In the production of good butter, much no doubt depends on *soil* and *herbage*; and something, perhaps, on the species of *cow*:—much, nevertheless, depends upon *management*.

The different stages of the art are,

1. Milking the cow.
2. Setting the milk.
3. Preserving the cream.
4. Churning.
5. Making up the butter, for present use.
6. Putting it down, for future use.

1. *Milking*.—Cleanliness is the basis of the whole art.—A dairy-maid should not be suffered to sit down under a cow with a pail which a fine lady would scruple to cool her tea in; nor until she has washed the teat of the cow and her own hands: and for this purpose clean water and a cloth should always be at hand.

A cow

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A cow should be milked at regular and stated hours; and, if possible, always by the same person: for cows, in general, will not give down their milk so willingly to a stranger as to one with whom they are intimate. The consequence is, the richest and best part of the milk is left behind in the udder, and the cow which is not clean-milked becomes *dry* prematurely.

2. *Setting the milk.* Much depends on the cleanness of the vessel, the degree of heat of the milk when set, and its depth in the vessel.

In summer it is difficult to set milk to cool:—in winter no time should be lost in getting it as soon as possible into the pan or milk-lead. Should it be set too hot in summer, “the cream does not rise so smooth and rich, nor in so large a quantity, as when it has been set of a due degree of warmth:—it is apt to come up *frothy*; and does not, in this case, prove well in the churn.”

Judicious dairy-women, therefore, in summer, pour their new milk first into a large earthen jar or other vessel, there letting it remain half an hour; or until it be nearly cool, and the *froth* be sunk; and then put it into the lead or
pan

pan, in which cold water has, until that time, stood.

If it be set too cool in winter, the cream will not rise so thick as when set immediately from the teat, or has had a little hot water put into the milk; viz. about a pint of water to a gallon of milk, or as much as will make it new-milk warm: that is, ninety to ninety-five degrees.

The depth of the milk should not exceed two inches: from one to two is a proper depth. If the milk be set too thick, the cream does not rise so freely; nor, consequently, in so large a quantity in a given time. If set too shallow, it is difficult to separate the cream from it.

3. *Preserving the cream*—The great art here lies in keeping the cream free from rankness, to a proper age.

Fresh cream affords a well-flavoured butter; but yields a less quantity than stale cream; it being a received opinion among dairy-women, that age, and a slight degree of *acescency* in the cream, increases the quantity, without injuring, sensibly, the quality of the butter; but that the smallest degree of *rancidity* in the cream spoils the flavour of the butter.

In winter, cream may be easily kept free from any degree of acidity; but, in summer, it re-

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quires some care to keep it entirely free even from rankness.

A quantity of cream, though ever so judiciously taken off the milk, will, when put into a vessel, and suffered to stand some time, let fall a greater or smaller quantity of milk.

It has been discovered that this milk, or dregs of the cream, which subsides at the bottom of the vessel, becomes rancid much sooner than the cream itself; and that, being suffered to remain at the bottom of the vessel, it presently communicates its rancidity to the cream: and further, that if it be permitted to mix again with the cream in the churn, the butter takes that marbled half-cheese-like appearance under which we too frequently see it.

Therefore, a judicious dairy-woman never suffers these dregs to remain any length of time under the cream. She has two means of preventing it; namely, repeatedly stirring them together to prevent them from subsiding too frequently; and, when a proper quantity is subsided, pouring off the cream into a fresh vessel, leaving the dregs behind. In summer, a good dairy-woman stirs her cream-jar every time (generally speaking) she

goes

goes into the dairy; and shifts it every morning (and in close muggy weather every evening) into a fresh, clean, well-scalded jar, or other vessel.

To take off the rankness of cream produced from turneps, the *Norfolk* dairy-women sometimes scald their cream: this however is allowed to lessen its productiveness of butter; and I was told by a lady, whose attention to her dairy entitles her to credit in this case, that putting a quart of boiling water into each pail of milk before it be set, is a more effectual and less wasteful remedy.

4. *Churning*. The principal art in churning lies in keeping the cream of a due degree of warmth in the churn; and in giving it a due and regular agitation. Warmth and a rapid motion makes it come quick: coolness, and a gentle motion, brings it slowly. If butter come too quickly, it is soft and *frotby*, and soon turns rancid; nor does it part from the butter-milk so freely, nor yields so large a quantity, as when it has been a proper time in churning. If it come too slowly, there is labour lost; besides the butter losing its flavour and texture. From one to two hours is a proper length of time in churning.

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If the weather be hot, the churn ought to be chilled with cold water before the cream be put into it, and should be placed in a cool situation: if cold, scald the churn with boiling water, and endeavour to churn in a warm room. If in either case these be not sufficient, add hot or cold water to the cream during the time of churning.

If the cream be inclined to get *frotby* in the churn, open its mouth for a few minutes, to let in the air, and give the froth time to dissipate; and the butter will generally come sooner than it would have done had the agitation been continued: for, while the cream is in a state of *frotbiness*, the butter will not separate. Reversing the motion has sometimes a good effect*.

* It is this state of *frotbiness*, (fermentation it cannot be called) which sometimes gives inexperienced dairy-women much fatigue of body, and anxiety of mind. In the days of witchcraft the cause was readily ascribed; and the witch was often successfully burnt-out, with a red-hot poker. The devil, to this day, is now and then subjected to a similar treatment; and with equal success: for while the poker is heating the froth subsides; and, in cold weather, the warmth communicated to the cream renders this stroke of heroism doubly efficacious. There may be other causes (than the frothiness of the cream) of that obstinate delay which not unfrequently happens in this important operation; which well deserves a philosophical investigation.

If

If the butter come in small particles which are slow in uniting, strain off part of the butter-milk; and the butter in general will sooner gather. Reversing the motion generally gathers the butter quickest †.

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5. *Making up the butter.* When the butter is sufficiently gathered in the churn, which is known by the largeness of the lumps, and the cleanness of the *dashers*, it is taken out; kneaded in a bowl, or other shallow vessel, to let out the butter-milk; spread thin over the inside of the bowl, and clean cold water poured over it; kneaded, broken, and re-spread in the water; the water poured off; the butter beaten, in large lumps or handfulls of three or four pounds, against the side of the bowl; re-spread; salted; the salt worked in; re-washed; and re-beaten, until the water come off unfullied; which it will do after two or three washings. It is then broken into pound-lumps; re-beaten against the bowl; and printed, or otherwise made up.

But before the dairy-woman begins to take the butter out of the churn, she first scalds, and then plunges immediately into cold water, every vessel and thing which she is about to make use of; in order to prevent the butter

† A horizontal or barrel-churn is here to be understood.

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BUTTER.

from sticking to them. In summer, when the butter is very soft, it is sometimes necessary to rub them after scalding with salt, which greatly assists the wood in retaining the moisture.

She also puts her own hands into the hottest water she can bear them in; rubs them with salt; and immediately plunges them into cold water:—this she repeats as often as she finds the butter stick to them.

There is a *finishing* operation, which is sometimes given in the neighbourhood of the metropolis, and perhaps in some few provincial districts: in general however this excellent finish is omitted;—either through want of knowledge, or want of industry, or through *policy*: for its use being to give not only firmness and a wax-like evenness of texture to the butter, but to extract from it entirely the butter-milk and the water in which it has been washed, the quantity is thereby lessened; for so many ounces of milk and water extracted, so many ounces fewer of butter go to market: this however is the best proof of its utility; and butter cannot strictly be said to be marketable, until it has undergone this operation: which is thus performed.

The bowl or tray being wetted to prevent the butter from sticking to it; and a cheese-
cloth

cloth strainer or other cloth being washed in clean cold water and wrung as dry as possible; a pound-lump of butter is placed in the bowl; and, with a stroke of the hand proportioned to the stiffness of the butter, is beaten with the cloth. As the pat of butter becomes flat and thin, it is rolled up with the cloth, (by a kind of dexterity which can only be acquired by practice) and again beaten flat; the dairy-woman, every three or four strokes, rolling up either one side or the other of the pat, and moving it about in the bowl to prevent its sticking. As the cloth fills with moisture (which it extracts from the butter and imbibes in the manner of a sponge) it is wrung and re-washed in clean cold water. Each pound of butter requires in cool weather four or five minutes to be beaten thoroughly, but two minutes are at any time of essential service.

In warm weather it is well to beat it two or three times over; as the coolness of the cloth assists in giving firmness to the butter*.

* 1781, JULY 23. Weighed a lump of butter before and after being beaten with a cloth. Before beating it weighed sixteen ounces and a quarter; after beating fifteen ounces and three quarters; just half an ounce of butter-milk and water being absorbed by the cloth, during about three minutes beating. The cloth was wrung equally hard before and after the operation: a considerable quantity of milk and water was wrung out of it.

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6. Putting

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BUTTER.

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BUTTER.

6. *Putting down.*—The more pure the butter is when put down, and the more perfectly it is afterwards kept from a communication with the outward air, the longer it will retain a state of perfect *sweetness*.

The purity of butter consists in its being free from internal air, moisture, filth, and a rankness of flavour.

The preservation of butter therefore depends principally on the *pasture* and the method of *making*. If the pasture be rank, whether through *soil*, *manure*, or *herbage*, it is generally injudicious to put down butter from it. But if the pasture be sweet; and the cows be properly milked, the milk judiciously set, the cream carefully kept, and properly churned; and the butter well worked up, with an additional quantity of salt; there is little art necessary in *putting it down* so as to preserve it sweet for several months: nevertheless the more judiciously it is put down, the *longer* it will retain its sweetness.

There are various vessels used for putting down butter. When a length of carriage is necessary, wooden firkins are the safest: glazed earthen-ware, however, is preferable when it can be made use of with safety and convenience: for, out of this, the external air may be entirely secluded.

The

The figure or shape of a butter jar should be that of the lower frustum of a cone ; namely, wider at the bottom than the top : resembling the standing or upright churn : the top of it being made sufficiently wide to admit of its being filled conveniently ; but not wider.

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BUTTER.

This form prevents the butter from rising in the jar, and effectually prevents the air from insinuating itself between the jar and the butter ; whose natural elasticity presses it, in this case, still closer to the sides of the containing vessel : but, were the form of this reversed, the same propensity of expansion in the butter would separate it from the sides of the jar, so that towards the top a knife might (as it frequently may) be drawn round between them, and the air of course have free admission.

The method of putting it down is this : — The butter having lain in pound-lumps twenty-four hours, the dairy-woman takes two or three of the lumps, joins them together, and kneads them in the manner in which paste is kneaded. This brings out a considerable quantity of watery brine ; which being poured out of the bowl, the butter is beaten with a cloth as before ; and the jar having been previously boiled, or otherwise thoroughly scalded, and
having

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BUTTER.

having stood to be perfectly cool and dry, the butter is thrown into it, and kneaded down as close and firm as possible, with the knuckles and the cloth alternately; being careful not to leave any hollow cell or vacuity for the air to lodge in; more particularly round the outsides, between the butter and the jar:—and for this purpose she repeatedly draws her finger round by the sides of the jar; pressing the butter hard, and thereby uniting intimately the jar and butter.

It is fortunate when the jar can be filled at one churning; but when this cannot be done conveniently, the top is left level; and, when the next churning of butter is added, the surface is raised into inequalities, and the two churnings united into one mass,

The jar being filled with butter to within two or three inches of the top, it is filled up with brine; made by boiling salt and water (in the proportion of a handful to a pint) ten minutes or a quarter of an hour; straining it into a cooling vessel; and, when perfectly cool, putting it upon the butter, about one and a half or two inches thick. If a wooden bung be put upon this, and a bladder tied over the mouth of the jar, butter thus preserved, from a good pasture

pasture, will remain perfectly sweet for almost any length of time; provided the jars be placed in a *dry* and *cool* situation.

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BUTTER.

110.

MAY 18. (See MIN. 97.). There is not now less than four pounds a head difference between these two parcels of bullocks! yet Mr. ——— is deservedly reckoned a good farmer; and has treated his heifers in the common way of throwing turneps to them; first on his wheat stubbles, and afterwards on his ollands.

BULLOCKS
AT
TURNEPS.

There was one thing, it is true, very much against Mr. ———: his best piece of turneps lay detached from his farm; except from a part which was too wet to be thrown upon; and although he got a neighbour to let him throw upon an adjoining piece of young clover (giving him the teathe for the conveniency) yet he had no other “shift” than that of his turnep-close itself; drawing from one part and throwing upon the part already bared; and this spring being unmercifully wet and cold, the bullocks stood to their dew-claws in dirt; and, what was worse, had no other place to lay down on. This was undoubtedly against them.

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110.
BULLOCKS
AT
TURNEPS.

Nevertheless it is observable, that bullocks in general, this year, have not done better than these. Mr. ———'s have not done better; he had three under-done ones "turned out" of Smithfield last Monday: and Mr. ——— is not an inferior grazier.

Yet notwithstanding the badness of the season, and the much-complained-of badness of turneps, this year, Mr. Baker's heifers have done extremely well. For, although they were bought-in on very high terms, they will, if they meet with a fair market, nearly double their first cost.

I have still continued to attend particularly to the fattening of these heifers; which was thus conducted. They have had plenty of turneps and a "clean trencher" every day; with plenty of followers to lick up the crumbs; so that the fattening bullocks only picked and chose the prime of the turneps: and in this seems to consist the excellency of the management. For these heifers were fattened abroad, where they remained night and day; with straw scattered under the hedge. Toward the spring, however, when the turneps began to lose their goodness, they had *hay* instead of straw.

This practice, which is not peculiar to Mr. B. is very judicious; for the bullocks are thereby

thereby led on from turneps to grafs, without receiving a check between them.

The above is not the only instance of Mr. B.'s skill in grazing. Last year, he fold two Galloway Scots for near fifty pounds. These however he had kept "over-year;"—that is, from October 1779, to May or June 1781; eighteen or nineteen months.

But, a few years ago, he fold five Scots, in May-June, which he had bought in, at St. Faith's fair, the preceding October, for twenty pounds a piece. The lot consisted of ten:—the other five he fold at seventeen, eighteen, and nineteen, pounds each. This half score did not cost him quite nine pound ten shillings a head; so that, in about seven months, he doubled his money.

But what is still more, about four or five years ago, he bought nine *Irish* bullocks at St. Faith's; namely, seven at seven guineas each, and two at six pound fifteen shillings each. These he finished by the beginning of June, and fold (in Smithfield) four of the smallest at sixteen pounds a piece; the remainder at eighteen pounds or upwards. This is probably the greatest grazing that ever happened in the county.

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BULLOCKS
AT
TURNEPS.BREED OF
CATTLE.

Much,

110.
BUYING
BULLOCKS.

Much, however, may depend on the choice of a bullock for fattening. The Norfolk farmers know, or pretend to know, whether a bullock will *grow* during the time of his fattening; and it is the bullock which grows and fats at the same time, which leaves most profit to the grazier. If one may judge from Mr. B—'s success in grazing, he is deeply versed in this mystery; indeed, the heifers before-mentioned are a striking proof of his judgment in this particular. For they have grown very considerable, as well as fatted kindly; whilst the principal part of Mr. ———'s, out of which those were drafted, seem, as to carcasses, the same as they were last October.

A thick shin is a favourite point in a Highland Scot; and there may be other points symptomatic of a growing bullock; but I am apprehensive that a good grazier forms his judgment from general appearances, and from intuitive impressions, rather than from particular marks and signs: and I am of opinion, nothing but continued practice and close attention can make a man a judicious grazier.

111.

MAY 25. Yesterday Mr. ——— shewed me another account for eleven more of his heifers,

heifers, which happened to go up to a good market last week. They neated 104*l.* 17*s.* 10*d.* $\frac{1}{2}$, or 9*l.* 11*s.* a head. They cost about 6*l.* 15*s.* and therefore left a profit of 2*l.* 16*s.* a piece, only; but, considering the high price at which they were bought-in, and the untowardness of the season, they have not done amiss. He may thank, however, the fluctuation of Smithfield market.

The preceding week there was an uncommonly full market. Smith alone drove seven score. The demand was glutted and the prices low. (A farmer in the neighbourhood sent up three, which were sold for what he had expected for two of them!). This frightened the grazier; so that, last week, the market was thin, and they sold well.

A week or two at the finishing of the turneps seems to be an injudicious time to send bullocks to Smithfield and St. Ive's:—there is generally a glut about that time. If, therefore, bullocks are fit, they ought to be sent off a week or two before; if not, they ought, if possible, to be kept two or three weeks longer.

III.
BULLOCKS
AT
TURNEPS.

SMITHFIELD
MARKET.

112.

112.

DISTRICT.

MAY 28. Yesterday morning, set out, early, for Ingham fair—by way of the sea-coast.

Made the coast at Munsley, and kept it to Halbro'; sometimes riding above, sometimes below cliff.

There being a large fleet of ships, close in land, steering to the northward, with a gentle breeze upon the quarter, and the morning mild and pleasant, the ride became delightful; though sometimes rendered awful by the height of the cliff, and the narrowness of the path immediately upon the brink of it; more especially as the cliff itself is of an earthy crumbling texture, and liable to "shoots," whereby many acres are every year swallowed up by the sea.

SEA-CLIFFS.

Mr. Baker (who rode with me) shewed me the remains of a field, which men, now living, remember to have been twelve acres; of which there is now only a corner of two or three acres remaining. Had this piece lain parallel with the line of the cliff, every rod of it must have long since disappeared.

The loss is the greater, as the soil is rich and prolific in a superior degree. Noble crops
rise

rise close to the edge of the cliff; except in some places where the sea-sand is blown up in too great quantities; which it is, most particularly toward Munsley; where the cliff is not less than one hundred feet high; more than at Hasbro', where it does not rise ten feet from the beach.

In going above-cliff we saw two large heaps of marl, which have been got out of the face of the cliff.

This, it seems, is a common practice of the farmers whose lands lie next the coast. It is sometimes drawn up by a wince, which they call "davying" it up; or else run up in wheelbarrows, in oblique paths; made in the face of the cliff; in which manner these heaps appear to have been got up: but neither the place where it has been dug from, nor even the path or gangway, except just at the very top, are now to be seen; the whole having, in a few weeks, crumbled into the ocean.

Further along the coast, towards Hasbro', the farmers throw up a clay, out of the face of the cliff, which is here very low: and near the village of Hasbro' is found a white brick-earth esteemed the best in the county.

112.
SEA-CLIFFS.

MARL.

112.

COAST-
MARL.

I have examined the three different earths, and tried them in acid.

The "marl" is a white gritty chalky Norfolk marl; effervescing very strongly.

COAST-
CLAY.

The "clay" is of a browner darker colour, but interspersed with specks of a white chalky substance: this effervesces very considerably, but not so violently as the marl.

BRICK-
EARTH OF
THE COAST.

The "brick-earth" is of a dusky-white, or stone-colour. It is less harsh than the other two specimens; easily bursting between the fingers to a smooth impalpable powder; and effervesces strongly in acid. This did not surprise me, as I had enquired particularly into whether it was "good for the land;" for I have not yet found a clay which has been set on as a manure with success, which has not been strongly calcareous. I had, however, conceived that bricks could not be made from a calcareous earth. But the fact is, that this earth is calcareous, and that the Walsham brickmakers give 3s. a load for it upon the spot, and carry it six or seven miles, to make white bricks and pavements of.

COAST HUSB.

The farmer knowing, with a degree of moral certainty, that his land next the sea will shoot down into it, why does he not, at once, cart

cart away the rich top-mould for bottoms of dunghills; &c. and cast, at his ease, the marl or clay which lies beneath it? I saw no trace of a regular plan of this kind, either in this ride, or in the journey to Yarmouth.

Going below-cliff gave me an opportunity of seeing more fully the nature of the marram plant. The leaves proceed from a small crown; from whence, downward, proceeds a long simple hollow root, with verticils of fibres at different distances; according to the depth; the upper ones being only two or three, but the lower ones eight or ten inches, asunder. I measured one root eight feet long; and I apprehend the length is generally equal to the depth of the sand-bank. In mowing marram for thatch, the workmen keep their sithes an inch or more under the surface of the sand. Marram upon a cultivated soil (a ditch bank) grows with a broad flat blade, and does not take that rushlike form which it appears in upon the sand-banks.

Norfolk Husbandry. In a large inclosure near Ingham were thirty fine Scotch bullocks (belonging to a capital grazier in that neighbourhood); some fat, others fattening; weighing from fifty to sixty stone a bullock; consequently

112.

COAST HUSB.

MARRAM.

NORFOLK
HUSBAND.

112.
MARKETS.

worth from three to four hundred pounds.—
What a fight is this in an arable country!

Ingham Fair. There were three or four hundred head of cattle, and more fat bullocks than there were at Walsham and Worstead jointly; and these, too, finished in a superior style. The farmers in that country are, like their soil, strong in hand; and even now, bad as times are, are said to be getting money.

There were a good many buyers; but the fellers were unreasonable in their demands. They did not ask less than five shillings a stone for beasts that were tolerable meat. There might be from fifty to one hundred fold.

Very little young stock I apprehend was sold. There is indeed very little in the country; and now the farmers having, from the wetness of the season, a prospect of grass, they are unwilling to sell, except at extraordinary prices.

A farmer of South-Reps sold eight, two-year-olds, forward in flesh, and very pretty ones, for 5*l.* 10*s.* a head. This is paying him very well, though they have been at full keep ever since they were dropt.

FATTING
CATTLE.

It may be said that fattening cattle at two years old is nipping bullocks in the bud; so it may; but

but if this farmer, for instance, were to keep his bullocks till three years old, he would bring up calves in proportion; so that from a given quantity of land the community has the same or a similar quantity of beef.

Ingham fair reaches four or five miles round on every side. We breakfasted at Hasbro', baited at Ingham, and dined at Brunstead; a circuit which Mr. B. and his friends take every year among their relations and acquaintances. This species of sociability and hospitality is not peculiar to Ingham: Walsingham, Worstead, South-Reps, Alboro', St. Faith's, &c. &c. have their fairs, more famed for their hospitality than the business transacted at them; except the last, which is one of the largest fairs in the kingdom.

Yorkshire has its *feasts*; other countries their *wakes*; and Norfolk its *fairs*.—

113.

JUNE 1. This morning went to see Mr. Baker's six heifers go off for Smithfield-market, with five under-done steers of Mr. D.

The heifers are beautiful; one of them more especially: she is "full every-where"—no point higher finished than another; and is, to use the grazier's phrase, as firm as wax, and

112.

FATTING
CATTLE.NORFOLK
FAIRS.SELLING
BULLOCKS.

113.
SELLING
BULLOCKS.

appears so compleatly stuffed within, that she seems to walk with difficulty. There is another appears, *to the eye*, to be fatter than this; but she *bundles loose*; and will probably waste much in travelling; whereas Mr. B. has no doubt (and he speaks from experience) but that the former will *shew her points* better in Smithfield-market than she does now; adding, that a
“right-fat bullock does not shrink in travel-
“ling nearly so much as one which is only
“meaty.”

BUYING
BULLOCKS.

Enquiring, of the drover, as to who has sent up the best bullocks this year; he said, that Mr. *Rackham* of *Rippen*—Hall, had sent the best lot he had driven this year. Ah! says Mr. B—,
“Peter always buys a good bullock. If a man
“don’t buy a good thing, he can never expect
“to have any thing capital; he does not mind
“a few shillings at St. Faith’s:” adding, that
“we think nothing of a difference, at this time
“of the year, of three or four pounds a bul-
“lock; but look as much at shillings on Fay’s-
“Hill, as we do at pounds in Smithfield.”

This dropt spontaneously from Mr. B. and is, no doubt, the principle and grand basis of his own practice. For he always buys the best bullocks he can lay his hands on; and he is,
and

and has been for some years, esteemed very justly the best grazier in *this* neighbourhood.

It is observable that bullocks have got on very fast at grass this spring. Mr. B. gives for a reason, that the weather is cool; and altho' it has been wet, rainy weather does not hurt bullocks so much as it does sheep. Hot weather, he says, is the worst for bullocks; "it sets them a-gadding;—makes them cock their tails and run about the closes; and nothing checks them more."

113.

BULLOCKS
AT GRASS.

114.

JUNE 1. How helpless are the Norfolk farmers on a wet soil! If the water do not run through it like a sieve, they are at a stand: if it lodge on the surface, they are lost.

NORFOLK
HUSBAND.

This uncommonly wet spring has embarrassed them. Mr. ———, one of the oldest and best arable farmers in the neighbourhood, came to me the other morning to desire I would let him have a little wood to "bush-drain" a piece of land, which he wanted to sow with barley; but which he could not get on to; it being under water!

I reasoned with him on the impropriety of under-draining a piece of land while it lies

114.
NORFOLK
HUSBAND.

fopped in wet, and which was to be immediately trodden with the plow and harrow-horses. I could not, however, convince him of his error; and, hoping that it might hereafter be of some use, as well as to prevent a clamour, I this morning went and set him out some alders (just broken into leaf!) and went to see his operations; which are in some forwardness.

The close is nearly a square of ten acres;—lying with a most desirable gentle descent; and the little quantity of water which stood upon it was towards the bottom of the piece; in the place where the water-furrow is usually made; but where he is making a trench for a sub-drain!

The soil is a strongish sandy loam; lying on a perfectly sound absorbent brick earth; but which, from three or four months continual rain, had become fatiated: and all that could be possibly wanted, at present, was a surface-drain to carry off the superfluous water.

His son, who I found was a principal in the business, though deservedly esteemed one of the best husbandmen of his years in the county, went with us.—He seemed to think that the water might have been got off, but then how were they to have plowed and harrowed
without

SOIL
PROCESS

without filling up the drain? I told him, that if he had put one horse in a plow and drawn each furrow (the soil lying in five-pace warps), and afterwards had taken two and cut a deep cross-furrow; then set on one man to shovel out the crumbs, and another to open the eyes of the interfurrows with a hoe, every drop of the standing water might in a few hours have been got rid of: and—the land having lain in this state until a day or two of fine weather came—if he had then began to plow on the upper side of the close,—and worked towards the outlet, at the lower end of the cross-furrow,—he could have had no more trouble with the surface-water.

115.

JUNE 7. Fence-walls, carried to a proper height, are warmer and more durable than *battons*; the customary farm-yard fence of this country. (See BUILD. and REPAIRS, Vol. I.).

But, if walls are not raised to a proper height, they afford little shelter, and are continually liable to be uncoped by the cattle. The yard of Antingham-Hall farm is a sufficient instance of the former, and various instances of

114.

SOIL PRO-
CESS.FARM-YARD
FENCES.

115.

of the latter occur on different parts of this estate.

YARD-
FENCES.

A fence-wall to a farm-yard should not be less than six feet high; the coping is then out of the reach of the stock. Where dung is laid against it, the height ought to be still greater.

Battoning is very expensive, and frequently out of repair.

Posts, rails, and kids are, in many points of view, preferable.

116.

BUILDINGS

JUNE 8. It is very dangerous to run up *sea-stone walls* too quick. Mr. — had one shot down the other day at Antingham, and nearly killed one of the workmen. The weather was wet, and the bricklayer run up the wall, at once, without stopping, at intervals, to let it settle. The stones, being already saturated with wet, could not absorb the moisture of the mortar;—the air being also moist, the mortar, of course, remained pappy; and sea-stones, being globular, have no other bond or stay than the mortar; which being unable to hold them together, the super-incumbent weight crushed down the whole.

Had

Had the bricklayer proceeded by stages, letting the lower parts get sufficiently firm before the upper parts had been laid on, the mortar would have had time to stiffen, and the wall would have stood.

If the stones and air be dry, one halt, when the wall is a few feet above the foundation, is generally found sufficient.

117.

JUNE 13. This afternoon, went to see the Smithfield drover pay off his "masters," at his chamber, at the Angel, at Walsham (Market-day—Thursday).

The room was full of "graziers," who had sent up bullocks last week, and were come to-day to receive their accounts and money.

What a trust! A man, *perhaps*, not worth a hundred pounds, brings down twelve or fifteen hundred, or, perhaps, two thousand pounds, to be distributed among twenty or thirty persons, who have no other security than his honesty for their money:—nay, even the servant of this man is entrusted with the same charge; the master going one week, the man the other: but so it has been for a century past; and I do not learn that one breach has been committed.

The

116.

SEA-STONE
WALLS.

SELLING
BULLOCKS.

117.

SELLING
BULLOCKS.

The business was conducted with great ease, regularity, and dispatch. He had each man's account, and a pair of small saddle-bags with the money and bills, lying upon the table: and the farmers in their turns took their seat at his elbow. Having examined the salesman's account; received their money; drank a glass or two of liquor; and thrown down sixpence towards the reckoning, they severally returned into the market.

Last Monday's market being what is called a "whipping market," the room was filled with cheerfulness and satisfaction: there was only one long face in the company. This was a farmer who had sent up three bullocks, for which he had twenty-four pounds bade at Walsham fair; whereas the salesman's account from Smithfield, notwithstanding the goodness of this week's market, was only twenty-two pounds.

Such is the uncertainty of Smithfield-market; and such the misjudgement or partiality of the Smithfield salesmen. If these bullocks were worth twenty-four pounds at Walsham fair, they ought after three weeks or a month's grass, and considering the market and the expences incurred, to have fetched twenty-seven,
twenty-

twenty-eight, or thirty pounds, in Smithfield; but they will not neat twenty-one pounds. From twenty-two pound, the gross sale, deduct the expences, seven shillings and one-penny half-penny a head; there remains only twenty pounds eighteen shillings and sevenpence half-penny: little more than two-thirds of their value.

Last week, it is true, this farmer had the best end of the staff: four bullocks, belonging to four separate graziers, were sold in one lot; and the salesman divided the lot equally; though it was allowed that this farmer's bullock was not worth so much by two pounds as some of the lot!

Mr. Baker received for his six heifers. They sold uncommonly dear; far exceeding what we had laid them at; for instead of five shillings, they fetched nearly six shillings a stone. One of them which we had laid at forty-eight stone sold for fourteen pounds*.

The

* Among these heifers was a seventh — a “foul-dugged” one: namely, an open heifer, which had dropt her calf in coming from Scotland; and was given to Mr. B. by one of the drovers, to make him amends for a hard bargain of last year: an instance, this, of generosity in the drover.

This heifer was treated the same as the other six; among which she was fatted; and was, as to fatness, on a par with the rest; was somewhat larger; and would, no doubt, *prove* nearly as well: nevertheless, Mr. B. knowing the disadvantageous predicament she stood in, did not lay her

117.

SMITHFIELD
MARKET.

117.
SMITHFIELD
MARKET.

The under-done steers, which went up with these heifers, (see MIN. 113.) sold for nothing: They did not fetch above eleven pounds a-piece, one with another, notwithstanding they weighed considerably more than the heifers.

This shews the absurdity of sending bullocks to Smithfield before they be fat: Mr. B.'s were "right-fat," and fetched six shillings;—Mr. D.'s only "meaty;" and did not fetch four shillings and sixpence, notwithstanding the extraordinary market.

118.

DISTRICT.

JUNE 17. On Saturday last set out for the BLOWFIELD HUNDRED, and the YARMOUTH MARSHES, in company with Mr. John Hylton, of Felmingham, who formerly resided in that district.

We passed through the following Hundreds and Parishes.

at more than ten pound. But following these heifers to London, and falling in company (on the eve of the market) with a butcher, to whom he related these circumstances, he got twelve pound ten shillings for her: a striking instance, this, of the advantage of following bullocks to Smithfield: and, in similar cross cases, or when the lot sent up is extraordinarily large, it may sometimes be prudent for a Norfolk grazier to attend the market in person; but, in general, *perhaps*, it is three or four guineas, and three or four days, *unprofitably* spent; provided the grazier can depend upon the *uprightness* of his salesman.

IN GOING.		RETURNING.	
HUND.	PARISHES.	SOIL.	HUSB.
North Erping-ham.	Gunton	fandy loam	good
	Antingham	ditto	ditto
South Erping-ham.	Felmingham	light	passable
	Swanton	good-wheat loam	good
	Scottow	ditto	very good
	Score Ruffon	various, and common fields	middling
Taver-ham.	Coltishall	ditto	ditto
	Belagh	ditto	middling
South Wal-sham.	Wroxham	pretty good	ditto
	Salhouse	light	---
Blow-field.	Monfehold Heath	heath	---
	Hemlington	part heath	---
Blow-field.	Blowfield	good wheat land, and hops	good
	Bradstone	ditto	ditto
	Srumshaw	various, and common	various
	Lingwood	wheat land, and common	ditto
South Wal-sham.	Reighton	wheat land	middling
	Birlingham, St. E.	ditto	ditto
	Moulton	ditto	ditto
	Havergate	ditto	ditto
	Marfnes	ditto	ditto

* The lands of Scottow, Score Ruffon, Tunstead, Hosten, &c. if one may judge from the present black luxuriant crops of wheat, are nearly equal to those of the Happing Hundred.

RETURNING.		HUSB.	
PARISHES.	SOIL.	HUND.	HUSB.
Marfnes Wickhampton Free Thorp	wheat land	South Wal-sham.	good
	ditto		ditto
	very good		ditto
Cantley Hattingham Southwood Buckingham Srumshaw Lingwood Blowfield Birlingham, St. A.	ditto	Blow-field.	passable
	with heath		good
	wheat land		very good
	ditto, and common		middling
	good land		ditto
South Waltham Ranworth Bafwick	tolerable wheat land	South Wal-sham.	ditto
	ditto		---
	ditto, and marfnes		---
Honing Hoston Tunstead	light, and heath	Tunstead.	various
	heath, and very good		ditto
	good wheat land		ditto
Scottow*(asbefore) Swanton Felm. &c.	ditto	South Erping-ham.	middling
	ditto		ditto
	ditto		ditto

118.
SOIL OF
BLOWFIELD.

The *soil* most prevalent in the BLOWFIELD HUNDRED is a rich dark-coloured loam, of a good depth; the farmers plowing from five to seven or eight inches deep; and affect to laugh at the shallow plowing practised by farmers in *this* part of the county:

MANURES
OF
BLOWFIELD

There is no *marl* in the Hundred; but, the river Yare running by the side of it, the farmers get marl very reasonably from Norwich; and set on about ten loads an acre. Dung they also get by water from Yarmouth and Norwich.

HOPS IN
BLOWFIELD

The first thing which struck me in Blowfield Hundred was a tolerably large hop garden:

We called upon a person in the village of Blowfield; who is owner of this and two or three more patches; he being the principal grower in the parish. Enquiring as to the quantity of hops grown in this neighbourhood, he said that, three or four years ago, there were ten acres of hops in the parish of Blowfield; which, he added, is more than can be collected in the rest of the county. At present, however, there are not more than five acres, and the quantity is every year declining. Hops have lately been low, and the crops have not answered the expence. There are two or three drying-houses in the town, but they are, except one, going to decay.

The

The principal crops of the Blowfield Hundred are wheat, barley, peas, and first-year's clover:

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ARABLE
MAN. OF
BLOWFIELD.

The *Wheats* are in general very promising, and mark the goodness of the soil, and the plentifulness of the manure of Norwich and Yarmouth:

Saw several pieces of dibbled wheat, which made an uncommonly beautiful appearance: but the practice is by no means general.

The *Barleys* have also a promising appearance; and

The *Peas*, which it seems are ten-fold more numerous this year than usual (owing to the present low price of barley), are luxuriant and very forward, considering the season. A large proportion of them "set;" that is, dibbled in.

The *Clovers*, where they have taken, are fine; but the *Rye-grass*, in general, hides the small quantity of clover, even of the *first year*: and as to *two-years lays*, there is scarcely a piece to be seen in the whole Hundred: the soil is said to be "quite tired" of this crop. The seedling-plants are in general sufficiently numerous, and look very promising the first autumn; but go off in the course of the winter.

Their *Turnep*-crops, too, have failed them of late. Mr. Batchelor, of Bradstone, (a sen-

118.

ARABLE
MAN. OF
BLOWFIELD

fible intelligent farmer, at whose house I slept) says, that twenty or thirty years ago, he never could get stock enough for his turneps: he has finished forty or fifty bullocks in a year: now, he does not know how to buy few enough; and does not finish more than twenty or thirty: the roots do not come to any size; and have no "tack" or prob in them.

The Blowfield farmers in general fat their *bullocks* in sheds, or in bins in the yard.

BLOWFIELD
BULLOCK-
SHED.

Some of their *bullock-sheds* are large expensive buildings. Mr. Batchelor has a very good one: it consists of a center building, thirty-six feet long, nineteen feet wide, and about eleven feet high to the eaves; with a pair of wide folding-doors at each end; and with a lean-to on each side, the whole length of the building, and eleven feet wide.

The center building is the turnep-house; the lean-tos, sheds for the bullocks; which stand with their heads toward, or rather in, the turnep-house; from which they are parted by a range of mangers only; having the full freedom of breathing in its spacious area. By opening the doors at each end, a sufficient degree of air and coolness may be given in the closest weather; while, behind, the eaves of the sheds are brought

brought down to within five feet of the ground, and are boarded with rough boards (excepting an opening at each end for the bullocks to creep in at) to prevent too great a coldness in severe weather; thus preserving a due temperature.

This shed holds twenty bullocks, ten on each side, fastened by the neck, with chains, swivels and rings, playing freely upon posts, seven feet high. At each corner of the turnep-house is a triangular bin for the topped-and-tailed turneps.

In autumn, the entire building is sometimes used as a temporary barn, for buck, peas, &c. and in summer, the center part is an excellent waggon-shed: had the doors been made a foot and a half higher, it would have been an admirable refuge for loads of corn or hay in a showery harvest.

The main building is covered with reed, the lean-tos with tiles.

At Ranworth I saw a still more expensive bullock-shed than Mr. B.'s; it being all close boarded and painted: the entrance for the bullocks are folding-doors, which shut close like the back-doors of a barn. The doors to the turnep-house, however, are I think still smaller than Mr. Batchelor's. The construction is

T 2

nearly

118.

BLOWFIELD
BULLOCK-
SHED. 1782
W. B. B. B.

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BULLOCKS
AT
TURNEPS IN
BLOWFIELD.

nearly the same as that of Mr. B.'s, which is a more substantial though rougher building.

The *turneps* are drawn into the house in carts, and shot down in the area; where they are topped and tailed.—The roots are given to the fattening bullocks whole; and the tops given to the cows and lean stock.

The man who tends the bullocks, tops and tails the turneps; in doing which he uses a very large knife and fork, made for the purpose; it having been found from experience that a man, who stands perhaps fifteen or sixteen hours in a turnep-house, cannot *handle* them in cold weather without injury to his hands. It is considered as a much more severe employment than that of drawing them in the field.

YARMOUTH
MARSHES.

The MARSHES were a new world to me. They form a vast level, containing many thousand acres, of a black and somewhat moory soil; formed, perhaps, originally of sea-mud: it being highly probable that the whole level has once been a gulf of the German Ocean.

Until about twenty years ago, this valuable tract lay principally under water; except in a dry summer. But during that space of time a number of windmills have been erected, which throw the water into main drains, formed for
the

the purpose. By this means the principal part of the marshes are freed from surface-water early in the spring; so that cattle may now be turned into them about the beginning of May, and are kept free long enough to permit them, in general, to remain there until near Christmas.

The Marshes, taken collectively, are, though nearly *level*, not perfectly *smooth*; being furrowed into inequalities by swamps; which, in their natural state, seem to have been the main drains of the mud-banks.

These swamps, or “reed-ronds,” in some places of considerable width, are now the main drains to the Marshes; from the grassy drier parts of which they are detached by banks of soil; which at once serve the purposes of roads, fences, and embankments.

In the beginning of spring, the water is thrown from the grazable parts into these reed-ronds;—which, in their turn, are also drained; and mown for thatch, hay, &c. so that, by the assistance of the mills, every part of the Marshes now become productive.

The grazing parts are divided into inclosures, of various sizes and figures, by means of water-ditches, of different widths, from five or six to eight or ten feet wide,

118.
YARMOUTH
MARSHES.

These water-fences, running in all directions, and being of various widths, makes it probable that the principal part of them were the smaller furrows, or partial drains, which carried off the rains, back-water, &c. in a state of nature.

The inclosures, or "marshes," run from ten or fifteen to forty or fifty acres each; belong to a variety of owners; and are rented by a still greater number of occupiers; almost every farmer, within fifteen or even twenty miles, having his marsh.

The *herbage* of these marshes is various, even in the same inclosure: for the individual marshes are far from being level; they being more or less scooped out into hollows; where the water lodges a considerable time after the higher parts are dry. On these grow a rich luxuriant herbage, composed of the choicest meadow-grasses; while on the moister parts grows a long wiry kind of grass, which I think the marshmen call "flat;" and which the cattle are very fond of. But none of the grasses being yet in blow (the *poa annua* excepted) and the aquatic grass not having yet formed its fruit-stalk (the season being unusually backward), I could not ascertain the species.

Marsh-worms.—The Marshes are infested by a grub, which last year destroyed many acres of
grass,

grafs, by eating off the roots about an inch below the surface. This year, the damage is trifling; there are, however, stripes to be seen in almost every marsh, which look nearly as brown as the soil itself. The grafs is totally dead; and by striking off the surface, with the heel of the boot, the grubs may readily be found. They are from an inch to an inch and a half long, and about the thickness of a goose-quill. Their colour is a dark dusky brown, with a black head, and two whitish lines waving irregularly from the head along the back to near the tail. They are generally believed to be the grub of the cock-chafer; but I cannot learn that any one has accurately traced the metamorphose.

The *stock* of the Marshes are principally young cattle, lean Scots, and old and young horses. There are, nevertheless, a considerable number of fatting bullocks; and some sheep.

I do not learn, however, that the Yarmouth marshes are equal, in their fatting quality, to those on the Thames, or to Romney marshes. Bullocks, nevertheless, which have been at turneps, and have had the spring-bite of clover, receive no check on being put into these marshes; but, on the contrary, get, in a few months, a very considerable improvement.

118.
YARMOUTH
MARSHES.

If they were properly drained from the puddles of surface-water which stand on them till late in the spring; their faces smoothed by levelling; and kept so by the harrow and roller; their quality might be much improved.

But, as to improvement, they are totally neglected: the cattle are permitted to poach them in winter; and the tussocks which they tread up remain stumbling-blocks to them all the summer: while the dung, collected by the marshmen, is sold to the upland farmers.

The landlord finds mills, opens the fence-drains, and hangs the gates; the tenant, who generally rents them from year to year, and frequently for only one year, turns in his stock as soon as the surface is freed from water, and keeps them in until the water, or the severity of the weather, obliges him to draw them off.

The stock are under the care of *marsh-men*, who live in cottages scattered over the Marshes;—each having his district, or “level of marshes,” to look after. His perquisite is a shilling upon the pound-rent, which is sometimes paid by the landlord; but more generally by the tenant.

The marsh-men also keep cows, which pick about in the swamps, roads, and uninclosed parts,
in

in summer; and for which they mow winter-fodder from the reed-ronds, &c. They carry their butter to Yarmouth, and in winter generally sell their *bay*-butter above the market-price of *turnep*-butter;—the universal produce of the county in that season of the year.

We entered the Marshes at Havergate, which stands on a bold swell, from whence there is a very extensive view of this great level; which, to the left, is terminated by Yarmouth (distant about nine miles); to which in summer there is a tolerable road, across the Marshes.

At the foot of the swell, the Marshes commence. For nearly the first mile, we rode to our horses knees in water. This watery part is common to Havergate, and there are two reasons for its being overflowed: It is no person's business to drain it; and, what is remarkable, it lies lower than the middle of the Marshes; which, it seems, is the highest, and the best, land.

The first marsh we entered was Mr. Batchelor's (who went with us). It contains about thirty acres:—his stock are sixteen fine bullocks; but it would carry three or four more; the grass being now footlock deep. These bullocks were at turneps last winter; at clover

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YARMOUTH
MARSHES.

in the spring; and are now doing very well. Part of them are already sold to the butcher, and the rest will be ready by harvest. This is a fair specimen of the present *quality* of these marshes.

We then went over Mr. Hylton's: his stock chiefly two-year-olds, and colts; with three or four three-year-olds, which he expects will be finished by harvest.

We afterwards rode through a variety of marshes belonging to their acquaintances and relations; and having seen a marsh-mill, we made a sweep towards the middle of the level, and came up at Wickhampton, where the entrance is almost free from water.

Marsh-mills.—The proprietor of a level of marshes either builds a mill himself, or pays so much an acre to a neighbouring mill; which engages to draw off the superfluous water.

The construction of these mills and the principle they act upon are beautifully simple. The body of the mill is built of brick, about twenty feet high, with sails similar to those of a corn-mill, but somewhat smaller. Upon the axis of the sails is fixed a cogged wheel, of about five feet diameter. This turns a horizontal wheel of the same, or nearly the same size;

size; fixed upon the mill-post, or upright beam; which reaches from the top to the bottom of the mill. Near the bottom of this beam is fixed a similar horizontal wheel; which turns a vertical one, fixed to the axis of the efficient wheel. *This*, as to construction, is a small undershot water-mill wheel; but, in its manner of acting, is directly the reverse; for instead of being forced round by a weight of water lying above it, it gathers up, by the means of its floats, the dead water among which they work, and forces it up into a drain resembling a mill-dam. This wheel works in a case of wood or stone, nicely formed to the floats; and at the head of the drain is a valve-gate, to prevent the water from receding when the mill stops; it therefore, in every respect, resembles a water-mill reversed.

The mill which I examined raised the water about three feet; which is fully adequate to the draining of the adjacent marshes.

119.

JUNE 22. (See MIN. 39.). Yesterday Mr. Robert Bayfield told me, that he has finished the sale of those nine bullocks.

One of them sold for ten pounds, and the rest for about nine pounds a piece; so that in

19s

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MARSH
MILLS.FATTING
CATTLE.

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FATTING
CATTLE.

less than seven months, taking the par of time, they have more than doubled their cost.

Suppose that he kept them, one with another, twenty-eight weeks; and that he cleared four pounds ten shillings a head; they paid him three shillings and twopence halfpenny a week; which, notwithstanding the high prices given this year, is great work for a bullock of less than forty stone; and shews, in a striking manner, the value of the Norfolk breed of cattle.

BREED OF
CATTLE.

120.

MANURE.

JUNE 30. Observing, the other day, a dung-hill, which a judicious husbandman was setting about for turneps, covered with ashes,—I asked him the reason of it. He said, that the muck being pretty long when it was turned over, and the weather since having been dry, there was much long strawy muck at the top, and on the outsides, which would have been in the way of the harrow, and would have kept his light land too hollow; he therefore set it on fire.—A new idea; and, in this instance, well applied.

121.

121.

JUNE 30. It is very observable, that after the late cold wet spring, wheats on *scalds* are affected in a manner similar to what they suffer by a dry hot summer! looking yellow and puny.

But it has been said, it seems, by an old man, who was the oracle of his neighbourhood, that "nothing is so cold as sand wet."

If this be a fact, it may account for this very remarkable incident.

122.

AUGUST 8. This year, the spring being moist and the weather fine, the young turnep-plants got out of the way of the "fly," which usually attacks them in their seed-leaf state, with very little injury; and a fairer prospect of a general and full crop of turneps has not been seen for several years.

Many farmers had begun to set out their plants with the hoe; little suspecting they were throwing away their labour, and putting their crops in the way of immediate destruction.

The alarm, in this neighbourhood, was given about a month ago at South-Reps; where an
early-

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SUB-SOIL.

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early-sown piece of turneps, through which a footpath lies, was observed, by passengers; to be covered with the suspected flies.

The report of this circumstance was carried immediately, by a farmer's servant, to the coast, about Backton and Walcot; where, the turneps being still forwarder, the farmers (who on that part of the coast either did not observe the flies, or, if they did, were not aware of their evil effects) were busy hoeing; and received the intelligence with a smile; congratulating themselves on their better fortune; for not a fly was to be seen in their fields: but, on turning up the under-surfaces of their plants, they found them swarming with young caterpillars; and immediately stopped the hoe.—In the course of ten days or a fortnight the entire sea-coast was stripped; and the country in general, if reports may be credited, has already sustained an injury which may be felt for many years.

Notwithstanding, however, the flies had escaped notice on the part of the coast above-mentioned, they were too numerous and too conspicuous to pass unobserved on other parts of it; more especially about Cromer; where they were observed, several days, before they
were

were seen in this neighbourhood; and where the observations made this year strongly corroborate the idea of their being brought across the sea during a continuance of north-east wind.

Mr. Howse, of Overstrand, (who lives near the beach, and who is a man of good credit) declares, he saw them arrive "in clouds, so "as to darken the air;" and the fishermen of Beck-hithe have made the same assertion: while, from the reports of several persons who live upon the coast, they were seen in such numbers upon the cliffs, and in the adjoining grounds, that, being apparently spent with their flight, they might have been "taken "up by shovel-fulls*." Even in the above-mentioned foot-path piece at South-Reps, three miles from the sea, they were described as resembling "flights of bees."

The 28th July, I walked over this piece with Mr. John Baker, its proprietor. In about

* Afterward, hearing a person (unknown) relating this circumstance, I asked him particularly as to the thickness the flies might lie upon the ground; he said, in some places he believed they lay two inches thick; adding, that they might have been raked up into heaps of almost any size. Perhaps, had fire been put to them in this critical state (which perhaps was not altogether a state of rest but of copulation), numbers might have been destroyed.

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ten days after the appearance of the flies, the young caterpillars began to appear on the under sides of the leaves of the plants; and, at the time I saw them, which was about ten days more, the plants were entirely eaten up; nothing but the skeleton or stronger fibres of the leaves being left: except upon a small patch or two towards the middle of the close; and except on a border, round the outside, under the hedges, of a breadth proportioned to the height of the hedge or tree adjoining.

On the west side of this close there was a striking instance of this circumstance. One end of the fence is free from trees; the white-thorn hedge, here, rising 10 or 12 feet high: under this part, the border was something more than the height of the hedge. The other end of the fence is full of pollards, with tops from 18 to 20 feet high; and there the width of the border was in due proportion. The first pollard marked the difference with the greatest exactness!

Almost every inclosure has a similar border; and, in some small pightles set round with high trees, the plants have almost entirely escaped.

Large open fields, and smaller inclosures which lie open to the sea-ward, have suffered most.

most.—The hangs of hills dipping from the sea have suffered less;—owing, perhaps, to the flies overshooting them in their flight.

The shade of the trees, or the instinct of the animal, may likewise account for the borders round the inclosures; but why one patch of a field should be less affected than another, seems somewhat mysterious. Perhaps, the insects, being naturally gregarious, may hang together in bodies, even while they are depositing their eggs.

These patches and borders however, though they escape the fly, do not long escape the caterpillars; for no sooner have they devoured their foster-plant, than they begin to travel in quest of a fresh supply of food; and one side of the piece being finished, they with a wonderful instinct travel in bodies towards the other. The whole field being finished, the gateway and the adjoining roads have, it is said with great confidence, been seen black with them.

They seem to neglect entirely the grasses and every other plant, turneps and charlock (*Sinapis arvensis*) only excepted. The last they are said to devour with greater avidity than they do the turneps themselves.

Mr. Baker instances a corner patch, which, for want of hoeing, had got up almost knee-

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high: the turneps were much eaten, but the charlocks were stripped to the top.

Various experiments have been tried for their destruction.

Mr. Baker tried *lime*, sowing it in the middle of the night, when the plants were moist with dews, but without effect.

He also tried *rolling*. This checked them, especially if two or three times repeated, but did not save the plants. It is observable, however, that the plants under the hedges, though they had been run over two or three times with a heavy roller, did not appear to be injured by the operation.

Mr. Chandler, of Munfley, is said to have tried *foot* without effect.

Ducks have been tried by several, and with universal success.

Poultry are said to be equally beneficial; and, if one may judge by a single circumstance,

Rooks are highly serviceable. A large piece of turneps lying in an open field has escaped in a remarkable manner; it lies near a rookery, which is a general rendezvous for these birds; and I recollect to have seen this piece, more than once, covered with them.

Where

Where the plants have been hoed out, many persons have *hand-picked* them; but this is tedious and expensive, where the numbers are great. I have myself counted twenty caterpillars on a plant, not much larger than my hand. Mr. John Joy declares, that he has reckoned "sixteen score" upon one turnep; but it was a large plant, which had been hoed some time.

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It has been almost a universal practice among farmers, when one part of a close was cut off, and the caterpillars were marching to attack another part which was less infested, to draw a furrow between them, deepening it with a spade into a kind of a *trench*, making the side towards the plants to be defended as upright as possible; or, if the soil would stand, somewhat overhanging, in order to prevent the caterpillars from scaling it. This, if well done, had generally a good effect; and it was not uncommon to see the bottom of the trench entirely covered with them.

I have seen a trench across a gateway between two turnep-pieces for the same purpose.

Another expedient practised by many for checking the caterpillars was, to draw a *cart-rope* over the plants, in order to shake them

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off, but cannot learn that it ever proved effectual.

A labourer tells me, that in the “canker year,” about twenty years ago, the best contrivance that was then hit upon was a kind of brush made of *furze*; by fixing the branches to a long pole or axle-tree, with a wheel at each end, of such a height that the *furze* brushed the plants without pulling them up by the roots. This not only brushed the caterpillars off the plants, but numbers of them were stabbed and destroyed by the prickles of the *furze*. This, in theory, is very plausible, and might be good in practice; but I have not seen it, nor heard of its being used, this year.

The expedient which has this year caught popular attention most, is that of brushing the plants with twigs of *elder* tied upon a waggon-rope.

Yesterday, having heard much of the success of this expedient, I called upon the farmer* who had gained the most credit by it, to learn from himself the particulars; and to see the plants.

The brush is judiciously made of the straight luxuriant shoots of this year, about the thick-

* Mr. Jonathan Bond, of South-Reps.

ness of the finger, and from two to three feet long. These are tied upon the cart-rope with rope-yarn, about four to six inches apart, and about eighteen or twenty feet long upon the rope. It is drawn by two men, and takes half a ten-pace warp (about a statute rod) at once. The men lay hold near the twigs:—the two loose ends of the rope being tied together, and drag at a distance behind the elder.

The circumstances attending the piece of turneps said to be saved by this contrivance, were these: part of the close had been sown early, and the plants were in rough leaf when the yellow flies first made their appearance:—the other side of it was not sown until after that time. The forward part being entirely cut off, the ground was plowed and sown a second time; but the plowing and harrowings did not kill all the caterpillars:—thousands were seen on the surface of the ground travelling towards the backward-sown part; the plants of which had then got to a considerable size.

The farmer perceiving this, drew a furrow and made a trench between the two parts; and he and his man three times a day (viz. in the

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morning before they went to their day's work, at noon when they came home to dinner, and at night when they returned from work) drew the elder-brush over the plants. The piece is about three acres, and it generally employed them about an hour and a half; especially in the morning, when the dew made the elder drag heavy. He has used the brush about ten days, in which time he has renewed the elder three times; and it is now nearly worn out.

After looking attentively for some time among the plants, I saw only two caterpillars; and so healthy a piece of turneps I do not recollect to have seen: they have been sown only three weeks, yet they are now fit for the hoe.

In riding towards North-Reps, I saw a similar machine; but this is made of the rough boughs, not the twigs. It is a large awkward unmanageable thing:—the woody crooked boughs, some of them almost as thick as the wrist, drag up or lacerate the plants; whereas the straight twigs, lying flat and evenly upon the ground, shake them in a most effectual manner, without doing them the smallest injury; every plant is kept in a quivering motion from the time the rope touches it until it be passed by the last leaf: and, perhaps, in this consists the merit of the invention.

The

The received idea, however, is, that the elder is in its nature noxious to the animal. But this I much doubt; indeed, the experiments which I have made convince me that the idea is erroneous.

The evening before last, I took some fresh elder-leaves, bruised them between the hands, broke them in the middle, and put them with a caterpillar into a small tin-box; shutting it up close with the cover. Yesterday morning, it was as brisk as when it was put in.

Yesterday, I took a turnep-leaf and whipped it with a twig of elder, and afterwards pressed them together between the hands for some seconds, and then put the turnep-leaf into a box of fresh-gathered caterpillars. This morning nothing but the fibres were left,

Among another parcel of caterpillars I put a fresh-gathered turnep-leaf untouched—another whipped, &c. with elder; and a charlock-leaf also fresh-gathered. This morning the elder-leaf was not only considerably eaten, but one of the animals was reposing itself upon it,

The leaf of charlock had only one perforation:—the untainted turnep-leaf had several.

It seems therefore evident that elder, so far from being fatal to these animals, is not in any

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degree disagreeable to them. The merit therefore of the elder-brush (if it has any) lies in its effectually shaking off the caterpillars without injuring the plants.

But it appears to me highly probable, that it was the trench, and not the elder, which saved the plants abovementioned. For if Mr. Thomas Shephard, of North-Reps, be accurate in the relation of an experiment which he made twenty years ago (and I have no reason to doubt his accuracy), brushing off the caterpillars is of little use. He relates, that he had a two-acre pigtle run over with a cart-rope, day and night, uninterruptedly, for some days, without any degree of success; for, small as the piece was, the plants on one side of it would be covered with caterpillars before the men reached the other side. Indeed, if we observe how soon they begin to crawl after being thrown down, and how fast they travel when upon their legs, it seems very probable, that being shook from the plants they may regain the leaves, so as to begin feeding again, in five minutes. It seems therefore in vain to expect any essential benefit from brushing them off the plants; for while they have life, they will encounter many difficulties to preserve it.

But

But whether the plants above spoken of were or were not preserved from the caterpillars by the elder-brush, I am very much of opinion, that in regard to their growth and healthfulness, they received some benefit from it. The exercise of the wind, it is well known, greatly accelerates the growth of turneps; and it seems not unreasonable to suppose, that the exercise of the elder-brush produced a similar effect. The plants in question are peculiarly fine, and the incident appears to me to be worth preserving.

Towards the sea, where the vermin were very numerous, the plants were stripped in a few days; so that if the farmer had had skill, he had not time, to save them. His only resource was, to plow up the ground and sow it a second time: and it is probable, that two-thirds of the turnep-grounds in East Norfolk have been subjected to this treatment.

But what is still more unfortunate, some of the farmers, who plowed up and resowed, have lost their second crop; for, being willing to save the borders and patches which had fared better than the main body of the close, they left them standing: but, the plow and harrow not being equal to the destruction of the whole of the caterpillars, those which survived crawled

to

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to the plants which were left ; which supporting them until the young plants got up, they returned and presently eat up the second crop.

Some few men are hardy enough to let the stalks and fibres remain standing ; hoping that they will shoot again ; and that they may by this means save their crops, as well as the trouble and expence of reſowing.

AUGUST 15.—In my rides to Wroxham, Baſtwick, Stanninghall, and Norwich, this week, I find that ſome hundred acres of turneps have been ſaved by Ducks.

Mr. Samuel Barber had, at one time, upon his farms, at Stanninghall and Woodbaſtwick, near four hundred ducks at work : and, thro' their induſtry, has ſaved a principal part of his crop :—had he begun to employ them ſooner, he believes he ſhould have ſaved the whole.

The different detachments (ſome of them near one hundred ſtrong) were kept by a boy or girl. They were regularly driven to water, and reſted three or four times a day : but had no corn nor any other food given them. After having drank, they would diſgorge the caterpillars in great abundance ; ſo that they ſoon fell to again with freſh appetites.

Half

Half or three-quarter-grown ducks are preferable to old ones, which are lazy, and will sooner eat the turnep-tops than run after the caterpillars.

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It is very amusing to see the young ones dart at their prey : these, however, when the caterpillars grow scarce, take to the turnep-tops, and after they have reduced the vermin to a certain ebb, do the turneps more harm than the caterpillars themselves do.

This has been used as an argument against employing ducks ; and, in respect to old ducks, it may have its weight : but if the caterpillars are so few as to tire the young ducks in looking for them, the plants cannot sustain any material injury from them.

The fact seems clearly to be, that where one acre of turneps has been saved by any other means whatever (hand-picking excepted) an hundred have been saved by Ducks.

Poultry may be equally good (and perhaps without the evil attendant of eating the plants); but their use does not seem to have been discovered, or attended to, until too late.

Also, when a piece of turneps has been in danger from the enemy in the neighbourhood ; but not already infested ; cutting a trench has per-

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perhaps been very beneficial: filling the bottom of it with straw, and, when the caterpillars were in sufficient numbers among the straw, setting fire to it, seems to be a late, though an ingenious improvement.

TENTHREDO
OF
THE TURNEP

AUG. 20. The first of this month I gathered, alive, eight or ten of the yellow flies supposed to produce the turnep-caterpillars, also a parcel of the caterpillars themselves.

The flies were easily caught by beating them from the leaf on to the ground, where they lie, apparently lifeless, time enough to be picked up. Brought them home in a small box, and put them into a drinking-glass, covered with perforated paper.

Before I could get a third fly into the glass, the two first, happening to be a male and female, were in the act of copulation; and before I could get in the whole, two more were in the same amorous situation. The party consisting of nearly an equal number of males and females, an almost incessant ardour prevailed, till the close of the evening; and, setting them in the sun the next morning, their amours were renewed.

Suspecting them to be of the genus *Tenthredo*, and being willing to discover the two serrated

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ferrated laminæ mentioned as the distinguishing character of that genus, I put one of the females to a slight degree of torture, expecting she would have unsheathed them as a weapon; but I was disappointed: I therefore (that her pain might be as momentary as possible) severed her head from her body; thinking that in the agony of death she might disclose them; but I was still left in the dark: for, to my astonishment, instead of death ensuing immediately the decapitation, her body seemed to experience no great degree of inconveniency from it. She ran upon the table. I turned her upon her back: she recovered her legs as nimbly as ever; spread out her wings, and actually made an attempt to fly. Three hours after her head was severed, her body was to appearance perfectly alive; and how long she lived afterwards I know not; for, conceiving that without the head the body could not be sensible of pain, I did not preserve or destroy it.

My curiosity, however, was afterwards gratified in a manner I had not expected; for putting a fresh turnep-leaf into the glass, as food for some caterpillars which were also in it, I perceived one of the female flies peculiarly busy in examining the different parts of

the

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the leaf; and observing her to be partial to a part which was fortunately on the outer side of the leaf towards the eye, I took a magnifier, and placing it against the outside of the glass, saw her very distinctly unsheath her instruments; insinuate them into the edge of the leaf, to a depth equal to their fullest length; and, having separated them so as to form a channel or pipe between them, placed her pubes to the aperture: remained in that posture a few seconds; deliberately drew out the instruments; sheathed them; and immediately went in quest of another convenient nidus. Standing by a window on which the sun shone strongly, and holding the subject between the eye and the light, I saw the operation very evidently.

The instruments are brown, resembling in colour the sting of the bee, but much finer, and appear to be flattened; but whether they are or are not serrated, I cannot be positive. In the course of two or three minutes I saw her make three or four deposits.

One of these flies lived eleven days; other two, eight or nine; the rest, seven or eight days.—The females died first.

What their food is I am not certain.—The only thing put to them in the glass were green turnep-

turnep-leaves. I fancied more than once I could perceive them feeding on the finer hairs of the plant; but am not clear as to the fact*.

In the close of the evening they take their stand, hanging down their heads, and putting their antennæ down to whatever they stand upon; remaining in this posture, and apparently in a state of sleep or stupefaction, until they become enlivened by the sun the next morning.

Their fœces are of the colour and consistence of cream, but dry to a white powder.

The female is considerably larger than the male, and, when upon the wing, appears to be of a brighter yellow colour.—On examination, however, their colours are similar.

The following is a pretty accurate description of each sex.

FEMALE FLY. *Antennæ*, or horn-like feelers; —consists of nine joints; the third joint from the head longer than the rest; measure one hundred and twenty-five thousandths of an inch long; are clubbed; and black.

* I have, since, frequently seen them drink the sap oozing out at the end of a broken fibre of a turnep-leaf; and I have, lately, discovered that dissolved sugar is a favourite food. *Jan.* 1787.

Head.

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Head, with the eyes, and two ear-like appendages, black.

Tentacula, or mouth-feelers,—four; amber-coloured.—Mouth whitish.—

Wings—four; deflex; thirty-five hundredths of an inch long; light-coloured membrane, with black nerves. Upper wings with strong, black, clubbed nerves along the outer edges:—under wings, less nervous; projecting one-twentieth of an inch behind the apex.

Legs—six; amber; with black feet, and five black articulations. Hind legs, three-tenths of an inch long.

Body (from the neck to the apex)—thirty-five hundredths of an inch:—bright orange; except two diamond-shaped scutuli, or patches on the shoulders, black.

Thorax—less than one-third of the length of the whole body.

Abdomen—more than two-thirds of the body; and fixed to the thorax, *without any inflection*. Its form is between the cone and the cylinder (the greatest diameter about half its length) composed of eight segments on the upper side; and six on the under side. Under the two imperfect segments lies the—

Pubes—which opens under the last perfect segment of the abdomen;—and the—

Sting

Sting *—composed of *three* † hanger-like instruments, with a spiral wrinkle winding from the point to the base; making ten or twelve revolutions:—length about one-twentieth of an inch. Inclosed in a *sheath*; opening longitudinally; and reaching from the pubes to near the point of the tail, where it ends in a black speck. This sheath stands edgeway to, and projects somewhat below, the body; but is situated principally in a recess in the abdomen.

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MALE FLY.—The same as the female; except that its antennæ measure only one-tenth of an inch in length, — its legs twenty-five hundredth, — its body two hundred and seventy-five thousandth, — and except that beneath the two imperfect segments lies a plain scale, covering the

Penis—which is inclosed in a cloven-hoof-like capsule; which forms the point of the tail.—In the act of copulation the two claws of the hoof expand, and, in some measure, embrace the female.—The penis is cylindrical, short, and of a transparent, cartilaginous substance:

* Improperly so termed; its use not being that of a weapon, but an instrument wherewith the female forms her niduses.

† But see forward.

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In copulating, sometimes the male, sometimes the female invites. The male leaping the female; and curling his tail beneath her's; they become united; and, turning tail to tail, remain about a minute in the act.

After separation, the female walks off with seeming unconcern; but the male remains stant for some time. No sooner, however, has he recovered himself, than he begins to dress for another amour, by cleaning and burnishing his body, and antennæ, with his legs; and, in about five minutes, becomes engaged in another embrace.

The CATERPILLAR, when full-grown, is about half an inch long, and one-tenth of an inch in diameter near the head; the body being somewhat smaller: twenty legs, six of them long (probably answering to the legs of the fly), and fourteen very short (perhaps, merely adapted to the caterpillar). The entire animal of a jetty black; (except a whitish line on each side, just above the setting on of its legs) with many wrinkles, but without hair.

Having arrived at some certain period of life, it fixes its hind parts to a turnep-leaf or some other substance, and, breaking its outer coat near the head, crawls out; leaving the slough fixed to the leaf.

It is now somewhat diminished in size, being less than half an inch in length, and thick in proportion; its colour, too, is altered from black to a blueish or lead colour; with a black line waving along its back; and with two small black eyes, which now are become conspicuous. It is still covered with wrinkles, and appears in every other respect the same animal as before.

It is entertaining to see (through a magnifier) the caterpillars eat. The avidity and voracity with which they feed are similar to those of a hungry cow turned into a fresh pasture; and the motion of the head and mouth is not unlike that of the quadruped. If a caterpillar begins in the middle part of the leaf, it first takes off the surface, towards it; and does not, at once, break through the leaf; but, having cleared a round part half-way through, it makes a perforation, and presently dispatches the other surface of the leaf: nor does it afterwards eat the two sides together, but grinds them down singly; until having made a circular hole of from one-tenth to two-tenths of an inch in diameter, it leaves this for another perforation.

It seems probable that these round holes are not the effect of the caprice, but of the

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instinct, of the animal, and that they are intended by nature for the conveniency of the female in depositing her eggs.

When the caterpillar is apprehensive of danger, he coils himself up in a circular form, putting his head and his tail together. If the plant on which he is feeding be shook, he immediately coils himself up and falls to the ground; where he lies to appearance inanimate, until he thinks the danger over; when he unfolds himself and soon remounts the plant.

AUGUST 21. Yesterday morning, going into a field, where some plants which had been stripped by the caterpillars, had been left standing to wait the effect, (to observe the progress these plants had made), I perceived some of the yellow flies among them. Being anxious to procure some, I went eagerly to the pursuit, and found them so abundant, that in half an hour I caught near forty, notwithstanding they were remarkably wild. Their alertness struck me; they being now more difficult to take than I had found them three weeks ago. This led me to the idea that they are the produce of the caterpillars which destroyed the plants above-mentioned; for the ground

ground being left unstirred, the chrysalises met with no interruption, but were left to the bent of their nature.

Wishing to trace this insect from the egg to the caterpillar state, I this morning took up a small turnep-plant with a ball of earth to it, and put it into a garden-pot, set on a saucer of water. Having a number of the flies in the receiver of an air-pump (somewhat bell-shaped, about eight inches high and seven in diameter) I put this over the plant with the flies sticking to it:—they presently quitted the inside of the glass, on which they were resting, for the plant; and the sun being warm, they seemed much delighted with their situation.

I looked with impatience to see the females begin to deposit their eggs, but could only perceive one which seemed any way inclined to the operation, and this did not go deliberately to the edge of the leaf and unsheath her instrument in the manner I had before observed.

AUGUST 22.—On Thursday the 15th instant, I put six blue caterpillars (bedewed with moisture exuding from their bodies) into a box, and (by way of drying them and placing them in a state somewhat resembling their state in nature) put some common garden-mould to them;

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covering two of them up with the mould, and leaving the other four uncovered; some of them being upon the bottom of the tin box; some upon a turnep-leaf, also purposely put in the box.

Friday the 16th.—The whole had disappeared.

Saturday the 17th.—Moving the turnep-leaf, found one under it, alive, but naked.

This morning, to satisfy myself as to the state of the other five, as well as to endeavour to procure a chrysalis, I searched among the mould with the point of a large needle; and turning up one, which stuck pretty hard to the bottom of the box, found it crusted with mould on every side, except that which was next to the box; on which there was a hole large enough to see the animal perfectly alive.

Being willing to collect all the authentic information I could respecting this interesting subject, I went down this day to Beck-Hithe, to enquire of the fishermen, there, whether they had seen the flies arrive in cloud-like flights, as had been reported they did.

Old Hardingham, and his partner, declared to me, and old Gregory had before declared to Mr. Robert Bartram, who went down with
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me, that they have this year seen repeated flights fly over their heads as they lay at a distance from the shore ;—that they have also seen them upon the sea, as well as upon the beach washed up by the tide :—and further, that they have seen those which the tide had left, begin, on the sun's shining upon them, to crawl ; and, having recovered themselves, afterwards take wing and fly away : and, moreover, seem to be of opinion that they sometimes light upon the water to rest themselves, and then renew their flight.

This appearing to me improbable, I have tried the following experiments.—I took one of the flies, and placed it gently on a bason of water. It lay upon it, with its legs regularly stretched out, as if lifeless. Having remained in this posture some time, I agitated the water in the bason : this roused it : and, having got its wings somewhat wetted, it raised its tail, and when the water had subsided, very deliberately dried them with its hind legs ; which having done, and having otherwise properly adjusted itself, it with the utmost ease took wing, and flew to the edge of the bason. This experiment I repeated with the same result,

I then took another between my fingers, in such a manner as not to injure it, and plunged

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it into the water; wetting it thoroughly, Its wings and body being by this means loaded with water, its utmost efforts to dry them were in vain :—it still, however, kept upon the surface, and made regular efforts in swimming; by which means reaching the water's edge, it crawled out, dried its wings, and took flight, without having received any apparent injury from the ducking.

Thus the fishermen may be right: in a smooth sea the flies may rest themselves upon its surface, and renew their flight; but, being once thoroughly wetted by the waves, they either perish, or are brought by the wind and tide to the shore; where, if alive, they gain foot-hold, dry themselves, and fly to dry land*.

* Being doubtful as to the genus to which this species of insect belongs; and being, *under the above date*, in possession of some living flies, also of some caterpillars and chrysalises, I embraced the opportunity of conveying one of them in each state to Doctor Morton, (principal librarian of the British Museum, from whom I had been happy in receiving more than one mark of disinterested friendship) in order that the species and its history might be ascertained; and, towards this intent, *as far as my observations had then enabled me*, as well as to apologize in the importance of the subject for the liberty I was taking, I accompanied them with the *substance* of the foregoing minutes on this subject. Dr. Morton was pleased to shew them

AUGUST 24.—Being struck with the before-mentioned incident of the fly living several hours without its head, I this morning, (Sat.) a quarter before seven, cut off the head of a female fly, which appeared very brisk and strong, dividing the neck close to the head, so as to leave the two black appendages fixed to the body, without maiming the legs. The body immediately recovered its legs, and stood as firmly and to appearance as free from pain as if its head had been still joined to it. I turned it on its back in order to view the different parts of it, and left it lying on its side; but it presently sprung upon its legs, and began to adjust and clean its wings with as much dexterity as if nothing had happened to it; continuing in that act for several minutes; and, when it left off, placed its legs regularly, firm, and upright as usual.

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Mr. John Baker saw it at nine o'clock standing in this position; and the Rev. Mr. Parkinson favoring me with a call between twelve and one, saw the same. It had, however, by this time to Sir Joseph Banks, (President of the Royal Society) and, through Sir Joseph's liberality and disinterestedness, the letter has the honor of appearing in the Philosophical Transactions, Vol. LXXIII. Part I. for 1783, page 217.
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time moved a few paces from its first standing-place, and got its head and antennæ, which lay by it, under its body! It continued upon its legs all day, and at bed-time I left it standing.

On Sunday morning, found it in the very same posture. In the course of the morning it had a regular discharge of the fœces. Wanting the stand of the microscope on which it stood, I made it walk on to a piece of writing-paper. This it performed without a stumble; and the instrument by which I urged it forward having ruffled its wings, it with the utmost propriety and composure adjusted them, and took its stand as before.

Between four and five on Sunday afternoon, wishing to move it more into the middle of the paper on which it stood, and being willing to try its strength, I put a large needle under its body, to lift it from the paper: it immediately laid hold of the needle with all its legs, and not only hung to it, but kept itself perfectly upright; and might, I believe, have been carried to any distance. Replaced it on the paper, when it took its stand as usual.

In the close of the evening it began to drop its body nearer to the paper, resting its tail upon it: but on examining the other flies in
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the evening, I find that to be the very posture in which they all repose themselves *in the night!*

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Monday morning, six o'clock.—In the same posture; but had moved upon the paper in the night. *In the day*, it stood on its legs as usual! At two in the afternoon Mr. Samuel Barber saw it.—About five, it cleaned its wings; and this afternoon seemed more alert than it had been since its head had been taken off,

Tuesday morning—As much alive as before. About nine it cleaned its wings, and seemed remarkably brisk. About two, I found it upon its back; —endeavoured to place it upon its legs; but it could not expand them, though it was still evidently alive. Nine in the evening, it appears to be quite dead. But, astonishing to reflect on, this fly has lived upwards of three days without its head! during which time several of its contemporaries have died with their heads on; so that it may be a moot point, whether cutting off its head shortened or lengthened its days!—Its life must have been merely vegetative; and the care of its wings pure instinct*.

* Wednesday morning, the whole dead, except five or six. Thursday morning, not one alive!

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AUGUST 25. This morning, to my great satisfaction, I at last saw another female deposit; and in a different direction to that in which I had formerly seen them. The fly had her tail directed towards me;—the only direction I could see her in. In this point of view I could not see her draw her sting, its edge being towards me; but saw the end of the case open, and, at first, stand expanded; but, as the instrument entered the edge of the turnep-leaf, (which she strode) the sheath began to close; and, having reached her fullest depth, became entirely shut. Having remained a while in this posture, she, with great deliberation, drew out her instrument; and, having resheathed it, stood motionless for some time, as if overcome with fatigue.

She was not less than two minutes in the operation, owing, I believe, to the age and stuntedness of the turnep.

I saw her withdraw her instrument very evidently; but, in the direction of my eye, it appeared single; whereas, in a side-view, it had appeared double.

AUGUST 26. On Thursday the twenty-first, gathered ten or twelve caterpillars, one or two of them remarkably long, namely, six-tenths or more,

more. All eat till Sunday the twenty-fifth. One left off about noon.—Placed it on a piece of paper, and covered it up with a little dry mould;—it crawled out not apparently by design; but it seemed to want more mould to root in: covered it half an inch thick with moister mould, taken from the garden (the weather moist): it kept moving under the mould for some time, but in less than half an hour the motion was not perceptible.

This morning the mould still undisturbed. About four o'clock in the afternoon, searched for it among the mould with the point of a needle, and found it sticking to the paper: blew away the loose mould, which now was become dry, and saw the coat perfectly formed, and adhering firmly to the paper.

AUGUST 27. On Sunday afternoon, 25th of August, put three caterpillars to the live turnep in the garden-pot; two black, one blue.—One of the black ones soon mounted the turnep, but the other seemed neither to have sight nor instinct towards it.

Perceiving the blue one near the root of the turnep, in an upright posture, I apprehended it was also going to feed; but on observing it more closely, I found that instead of the head
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being ascending, as I had thought, towards the plant, its head and part of its body was buried in the mould; and, by the motion of the part in sight, I found that it was in the act of burrowing.—In about half an hour it had compleatly buried itself; and had closed up the mouth of the hole so judiciously, that no trace of it remained on the surface of the mould.

Yesterday morning, eight o'clock, placed three more blue caterpillars on the mould in the garden-pot:—they had remained in a small close-shutting tin-box until they were as wet as moisture could make them, and seemed to be almost in a state of dissolution; so that I was afraid to touch them with the pliers. One of them, however, the liveliest, immediately took to the mould, and buried itself in less than an hour; the other two appeared sickly; but at twelve o'clock they had got a considerable way into the ground. About one, their tails were only to be seen: before four o'clock in the afternoon they had compleatly buried themselves.

AUGUST 28. Yesterday morning examining the nature of the female instruments more attentively, I discovered *four* hanger-like divisions;

not only in a fly which I then dissected for the purpose of further investigation; but in the very subject from which I wrote the above description, and which I had preserved; one of the *three* being double.

They are so extremely thin and transparent, that without a good light and a strong magnifier, it is difficult to distinguish between a double and a single *blade*.

I am now, however, fully satisfied as to their number and situation. — By putting the point of a fine needle into the orifice of the pubes, and drawing it towards the point of the tail, I separated the compound instrument into two extremely fine lanceolated laminae, each of which are evidently divisible into two somewhat hanger-like instruments, making in the whole four; one of which is placed on each side the pubes, and the other two on its lower margin towards the tail: — when united, they take the form of a lancet.

By cutting off the lower part of the abdomen just above the pubes, and drawing the part on to the point of a very large needle, the sting springs out of the sheath, and is easily

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easily separated in the manner above-mentioned.

The two sides of the sheath are not united at the back, as I had imagined, but are two distinct valves or pieces, until they incorporate with the coats of the abdomen.

N. B. I have repeatedly dissected the female instrument (by drawing the lower part of the abdomen on to the point of a pair of compasses) for my own satisfaction, as well as that of my friends, and have always found them exactly as above described.

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MARKETS.

AUGUST 28. CAWSTON-SHEEP-SHOW.—This fair is held the last Wednesday in August, for sheep, solely; principally lambs, brought by the West-Norfolk breeders, and bought up by the East-Norfolk “graziers;” in order to pick among their summerlies, and their stubbles, after harvest; to follow their bullocks in winter; and to be finished the next summer on clover, or the ensuing winter on turneps.

The West-Norfolk ewe-flock farmers also bring their crones to this fair; which the East-Norfolk men buy to put to the ram; and, having followed the bullocks and fattened their lambs,

lambs, are themselves finished for "harvest beef." To-day, there was, also, several pens of sheerling-wedders, brought by the West-Norfolk farmers, who keep what are called wedder-flocks (that is, buy wedder-lambs one year, and sell them as sheerlings the next), to be bought by the eastern or western farmers, to finish with turneps the ensuing winter: also considerable quantities of stock-ewes, two and three sheer; brought by those who are overstocked, or are throwing up their ewe-flock, and bought by those who are increasing, or "setting" a ewe-flock.

Sheep of all sorts were very dear; nearly double the prices they were last year, at this fair. Last year good lambs were bought for five shillings and sixpence, or six shillings a head: this year, ten to twelve pounds a score was the current price. Mr. Dursgate, who is now, since Mr. Mallet's death, esteemed the richest farmer in the county (having, it is said, made thirty thousand pounds by farming), was bade twelve shillings a piece for his whole pen (about three or four hundred): but he refused the offer. His and Mr. Martin's (also a capital West-Norfolk farmer) were the "top of the fair;" and they both of them asked

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fourteen pounds. Seven and eight shillings were asked for the diminutive "heath-lambs" (from the Brandon side of the county), not much larger than rabbits. Last year they were sold at three, or three and a half,—four the outside price. Notwithstanding, however, the high prices this year, a principal part of the lambs were sold.

There are several reasons for the high price of Norfolk lambs this year: the low price which they have borne for some years back has greatly reduced the size and number of ewe-flocks: another, there being no market for long wool, while Norfolk wool bears a high price, the Lincolnshire farmers are getting into the short-wooled breed of sheep; and have, it is said, bought up considerable numbers of Norfolk lambs, and stock-ewes, this summer: and another reason, the first sowing of turneps having been cut off by the caterpillar, the second sowing will produce better food for sheep than for bullocks.

Stock-ewes were sold from twelve to fifteen shillings a head; sheerling-wedders fourteen or fifteen shillings; and even a parcel of crones were sold so high as twelve shillings, but they were singularly good ones; in general,

ral, about seven to nine pounds a score: last year they were bought for four to five pounds.

Sheerling-wedders were the cheapest, and lambs the dearest stock. How a farmer could bid twelve shillings for lambs, when he might have bought wedders, of almost twice the size, for fourteen shillings, is somewhat remarkable*.

This is entirely a fair of business: scarcely a woman or a townsman to be seen in it. Many of the first farmers in Norfolk were there to-day; this being, I believe, the greatest "sheep-show" in the county.

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AUGUST 30. On Sunday the 4th instant put one black and one blue caterpillar into a box with a turnep-leaf: the black one died; the blue one laid itself up in a fold of the leaf, which it fixed to the bottom of the box. Last Sunday, the 25th, I fancied I could see the antennæ of the fly playing at one end of the chrysalis; and not being able to see it af-

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* My reasons for giving the minutiae of the business of fairs appear at the close of the article **MARKETS**, Vol. I.

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terwards, or to discover any progress which was made, I began to fear that the leaf was too tough for the fly to disengage itself: I therefore, yesterday morning, wetted it with dew, and set it in the sun; but in the evening, perceiving no appearance of life, I cut the chrysalis from the box, and found the animal perfectly alive: not in the state of a fly, but to all appearance in the very state in which it laid itself up. The part of the leaf which lay between its body and the bottom of the box was converted into a fine transparent lamina, and so fast glued to the box that I was obliged to separate them with the edge of a knife; or rather, to cut off the chrysalis coat close to the box (with which the chrysaline matter seems to be incorporated), making a hole in the bottom of the coat. Replaced it as nearly as I could in the position I had taken it from.

This morning, I find, it has got its tail out of the coat, and has given me a full opportunity of examining it. It is still the same blue caterpillar with a black streak down its back; appears quite healthy; and indeed remarkably plump and sleek. I am afraid, however, that by laying open the cell prematurely,

turely, I have caused an abortion : it is nevertheless a satisfaction to know the exact state in which they appear after having been laid up near a month,

AUGUST 31. On Thursday the 29th procured a fresh parcel of flies. Yesterday put a group of young turnep-plants into a garden-pot. Today put the flies under the glass-receiver.

Being nearly an equal number of males and females, and having been shut up in a dark box for two days, they began, on being placed in a hottish sun, to copulate with a degree of lasciviousness I had not before observed. The males not only remained longer in the act (from one to two minutes), but neglecting to dress themselves, in the manner I had before noticed, flew from embrace to embrace, with very little intermission. Three or four couple were generally engaged at once, and the females which did not happen to be in the act were venting their fury on their more fortunate sisterhood ; half a dozen of them, some double some single, being frequently engaged at once in battle-royal. Their furor lasted about an hour ; after which they appeared flat and spiritless.

I now put three of the females upon the
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young turnep-plants, and soon found my expectation gratified in the fullest extent; for the plants being succulent and tender (the rough leaves about an inch in diameter, and the seedling-leaves still remaining), they immediately began to deposit their eggs. I had put the glass over them, lest they should fly away; but this was unnecessary: I therefore took it off, and made my observations without restraint. The leaves were thin and transparent; the sun shone full upon them; and the flies were so tame that I could observe the operation in any point of view I pleased: even touching them gently while in the act did not disturb them. I saw not less than twelve or fifteen deposits; and Mr. Robert Bartram calling upon business, while I was observing them, also saw three or four.

I put them upon the plants between nine and ten o'clock in the morning; and leaving them between ten and eleven, did not return until past one, when I found them still busy in the act of depositing. My worthy and sensible friend, Mr. Parkinson, calling at that time, observed two or three operations. They soon afterwards, however, began to droop, and entirely left the plants.

I have now no longer any doubt as to the
opera-

operation. Having tried the texture of the leaf, and its fitness for her purpose (by piercing it repeatedly with the point of her instrument), and having chosen some convenient part on its edge (the choice of which seems frequently to puzzle her), the female adjusts herself for the operation, by placing one, two, or three of her feet on the upper, and the rest on the under, side of the leaf; but always clasping it with her hindmost legs, without which she cannot, with any degree of conveniency, perform the act.—Having taken her stand, she begins to feel for the middle of the edge of the leaf, which she finds by the help of her sheath, placing one of its valves on one side, and the other on the opposite side; by which means the point of her instrument easily hits the middle way. She then splits the edge of the leaf, and having made a shallow fissure about twice the breadth of her instrument, she begins to insinuate this downward, into the margin of the leaf; not in a line perpendicular to the edge, but obliquely backward; seldom making an angle of more than 45° . with the line of the edge, and frequently of less than 20° . running it almost parallel with it. Having got the instrument to near its fullest depth, she

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begins to describe a segment of a circle, bringing it round with a sweep until it almost reaches the margin of the leaf on the opposite side of the orifice; and thus, cleaving the leaf, forms a purse-like nidus within it.

This creates a work of considerable labour, in executing which she employs her four instruments with a skill and dexterity which is delightful to look on, but difficult to describe. The two in front she makes use of as hand-saws; while the two hinder ones are employed as springs to impel them forward, and make them lay hold of the work. What seems to make the operation go on smoothly and pleasantly to the eye, and with apparent ease to the animal, is, the manner in which she works her front instruments; which are not drawn up and pushed down together, but alternately, and separately, one of them rising while the other is pressed downward; as is evidently seen by their wrinkles or serratures; especially if viewed through a delicate transparent leaf, held between a good glass and a strong light.

The nidus being formed, the fly lets her instruments recede towards its center, where they remain motionless until the time of labour comes on; which is generally many seconds, often

often half a minute, after the nidus is finished: but the body having undergone a spasm-like agitation, the orifices of the pubes and the nidus, which are now intimately connected, become swelled out with a semi-transparent whitish matter, which is seen to glide slowly down between *two* laminæ (separated and formed into a funnel-like pipe) until having got near to their points, it drops from between them, and falls deliberately to the bottom of the nidus; where it plainly shews itself of an oval form. The points of the instruments being still carried farther backward, until they are safely freed from the ovum, they are carefully and leisurely withdrawn (nearly in the direction in which they were insinuated), sheathed; and the operation compleated.

SEPTEMBER 1. To make myself completely master of this subject, I put a fly, this morning, upon the same plants I had observed from yesterday; and finding her so tame that I could place her on any leaf I pleased, and even turn it to the light while she was in the act, I cut off one of the tenderest leaves, took it between the finger and thumb, placed the fly upon it, and holding them between the
 glass

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glafs and the light, ſaw five or fix compleat deposits in about twenty minutes: all exactly in the manner above deſcribed.

If the fly diſlike the part of the leaf ſhe has begun to work upon, ſhe withdraws her inſtruments, and ſeeks for a more commodious part. Sometimes I have ſeen her begin at an angle, where ſhe had not room for a nidus; at others, the leaf being curled, ſhe has found her inſtruments getting too near one ſide of it; and again, have ſeen her begin ſo near a former nidus that her inſtrument has broke into it: in either of theſe caſes ſhe deſiſted from going any farther.

It is very obſervable, that ſhe reſuſed entirely the ſmooth tender ſeedling-leaves, for thoſe which are rough and apparently more difficult to work upon: but inſtinct, no doubt, and not eaſe, directs her in the choice; for the ſeedling-leaves are of ſhort duration, and would probably wither before the caterpillar became perfected.

To-day, looking carefully to ſee if I could perceive any progreſs made in an egg which I ſaw deposited, laſt Sunday, in the edge of the live turnep-leaf, and which I then marked, I obſerved, to my great ſatisfaction, a young caterpillar feeding on the under-
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side of the leaf; and, on examining the edge, attentively, found a number of niduses; from three or four of which the animals had obviously escaped; they being empty, with a hole on their under-side, proportioned to the size of the young animal; and looking diligently on the under-surface of the other leaves, I found four more infant caterpillars.

In the afternoon, I discovered a sixth caterpillar, which, I apprehend, had escaped in the course of the day. The flies, I find, were put upon the leaves the twenty-first of August, and it is probable that some of the young caterpillars were perfected, and left their niduses, yesterday; so that they remained ten days in the egg-state.

Their form is that of the full-grown caterpillars:—their size, one-tenth of an inch in length:—their thickness in proportion:—their colour, a dirty white; except the head, which is of a jetty shining black.

They begin to feed on the under-surface of the leaf, as soon, I apprehend, as they escape from their confinement; and some of them were, this afternoon, stout enough to accomplish a perforation.

Being semi-transparent, their food may be plainly seen passing through their bodies; their
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viscera appearing to consist of one straight passage from the mouth to the anus.

They seem to have a perfect use of all their limbs and faculties, and cling so close to the leaf that it is difficult to shake them off.

SEPTEMBER 2. Yesterday, to try whether it be a universal faculty belonging to flies in general to live in a state of discapitation, or whether it be peculiar to the Tenthredo of the turnep, I separated the head of a common large blue house-fly, about a quarter before two o'clock. It immediately rose upon its wings, two or three inches high, and falling upon its back, spun round for some time: lifted it up by its legs, and letting it fall, it made use of its wings and lighted upon its feet, on which it now stood motionless. About seven it was still alive. Neglected to observe it later. This morning it is dead.

Thus it seems probable, that all flies have a faculty of living some length of time without the head; but that some flies will survive the decapitation much longer than others.

SEPTEMBER 2. To-day, put a female fly on to a succulent leaf of rape (*brassica napus*). She tried it over and over, both on the side and on the edge; but would not attempt to insinuate

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nuate her instrument; and flew away from it. Put her, immediately, onto a young turnep-leaf: in three minutes she made a deposit.—Replaced her on the rape-leaf:—she appeared to be disgusted; and would not offer to make a nidus:—but suffering her to walk on to the turnep-leaf again, she seemed much pleased; and there being a large perforation, she put one foot through the hole, and made a deposit; the first I had seen made on the margin of a hole in the leaf. She seemed to stand awkwardly for the operation; but, nevertheless, twisted her instrument in such a manner as to hit the middle of the leaf very accurately.

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OF
THE TURNEP

Saw the same fly, afterwards, make three separate deposits in the edge of a smooth seedling-leaf; but, perhaps, the edges of the rough leaves were already occupied.

Placed a caterpillar upon the rape-leaf; but it immediately walked off:—put it on again, and shut them up in a box; it eat very freely.

SEPTEMBER 5. The caterpillar lived upon this leaf until yesterday noon, when the leaf was become dry.

Put it on to the live turnep to pall its hunger; and then shut it up in a box with two very

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very tender leaves of sow-thistle (*sonchus oleraceus*).

This morning untouched, except a slight rasure on each leaf.—Returned it to the turnep-leaf;—it eat immediately.

SEPTEMBER 6. Yesterday, put two leaves of garden-mustard and two of garden-crefs (small fallading) into a box with a caterpillar, covering it up with the crefs-leaves, and laying those of the mustard at a distance. In the evening it had left the crefs untouched, and had got upon the mustard. This morning found it resting itself upon one of the mustard-leaves; but it had not eaten any perceptible part of it. Put it on to the live turnep; it eat a little, but did not quite finish one perforation; it having, I apprehend, almost done feeding: this experiment, therefore, is not quite decisive.

SEPTEMBER 6.—This morning, observing the state of the nidus which I marked the twenty-fifth of August, I perceived the young caterpillar had just come forth; its tail still upon the nidus. This, therefore, laid in the egg-state eleven days.

The nidus appears small, comparatively with the animal; which must lie coiled up in a very

compact manner. The body nearly white, and the head, except the eyes, also whitish.

SEPTEMBER 7. This morning I find two of the oldest of the young caterpillars have shed their exuvix; having left them fixed to the leaf of the turnep. What surprised me much was, to find them of a deeper black than they were before they cast their first coat; which had, within this day or two, become blackish; but this second coat is almost a jetty black.

One of them seemed but just disengaged from its slough; yet was remarkably lively, and appeared to be feeding; but, on touching the leaf somewhat roughly, it fell to the ground. This somewhat surprised me: because, before they shed their coats, it was almost impossible to shake them off. Small as it yet is, however, it had activity enough to regain the plant in less than ten minutes.

They are now six days old; one of them three-twentieths—the other four-twentieths of an inch long.

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SEPTEMBER 7. The seasons, during the last nine months, have been much behind the sun. Autumn lasted until the middle of January; Winter

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SEASONS.

Winter till the beginning of May; Spring until the month of July; and, now, we are in the height of Summer! I have been strolling about the neighbourhood this morning, and find the farmers in the throng of wheat-harvest! They did not begin, in general, until about a week ago.

Stock remained in the stubbles and pastures until after Old Christmas; some until February: indeed, the grass continued growing until December; and a fresh shoot was, in some places, observable in the middle of January.

Daisies began to appear about Christmas; honey-suckles, in general, foliated the first week in January; and the hazel catkin, having received no check, began to blow about the seventh of January: and, what is extraordinary, continued to blow, in intervals of fine weather, until the beginning of April; until which time the grasses, and wheats, were entirely at a stand, by a succession of cold, stormy, wet weather; but without much frost or snow.

The uncertainty of seasons in this country will appear by the following register of the advancement of the last and the three preceding springs.

The

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SEASONS.

	1779.	1780.	1781.	1782.
	Surrey.	Surrey.	Norfolk.	Norfolk.
The primrose blowed -	Feb. 7	Mar. 9	Mar. 15	Apr. 10
The hazel blowed -	Feb. 10	Mar. 10	Feb. 10	Mar. 31
The gooseberry foliated -	Feb. 20	Mar. 25	Mar. 20	Apr. 1
The fallow blowed - -	Feb. 20	Mar. 30	Mar. 20	Apr. 10
The elder foliated - - -	Mar. 1	Mar. 21	Mar. 28	Apr. 23
The wild rose foliated -	Mar. 4	Apr. 10	Mar. 28	Apr. 14
The hawthorn foliated -	Mar. 20	Apr. 18	Apr. 15	May 10
The floe blowed -	Mar. 25	Apr. 28	Apr. 17	May 12
The nightingale beg. to sing	Mar. 28	Apr. 24	Apr. 17	May 4
The hazel foliated - -	Apr. 1	Apr. 29	Apr. 21	May 22
The birch foliated - -	Apr. 7	Apr. 30	Apr. 22	-----
The elm foliated - - -	Apr. 7	May 1	Apr. 23	June 12
The cuckow began to call	Apr. 16	Apr. 23	Apr. 18	Apr. 20
The maple foliated - -	Apr. 12	May 4	May 1	May 26
The cowslip blowed -	Apr. 20	May 4	-----	-----
The swallow returned -	May 8	Apr. 23	Apr. 18	Apr. 21
The oak foliated - - -	Apr. 20	May 20	May 17	June 4
The ash foliated - - -	Apr. 25	May 22	May 29	June 10
The haw blowed - - -	May 1	May 25	May 27	June 15
Wheat shot into ear -	June 1	June 21	June 15	July 2
Wheat harvest in gen. beg.	July 28	-----	-----	Aug. 29
Turneps in full blow -	Mar. 25	-----	-----	May 12

In May, we had loud claps of thunder, with lightning, and a succession of rain and tempest, throughout the month! The farmers were distressed, even upon the light lands of Norfolk, to get in their barley: many acres, probably many hundred acres, were sown in the month of June! In the wet land countries, it is said, a considerable share of the grounds intended for spring-corn could not be sown; and much of that which was got in rotted in the ground.

The summer continued wet (excepting two short intervals) until the twenty-first of August,

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SEASONS.

when the weather took up; and the last ten days or a fortnight have been extremely fine and summer-like:—foggy mornings and hot parching days:—a finer wheat-harvest never happened.

TIME OF
SOWING.

But the barlies are still backward, some of them quite green,—scarcely a swath cut in the neighbourhood.—Nevertheless, the crops look well; especially the late-sown ones! a striking proof, this, that the farmer, in his time of sowing, ought to consult the *season* rather than the *sun* *.

* *Otober* 10. A piece of barley which fell more particularly under my notice (see M. 114.) was sown the fourth and fifth of June; and was cut the twenty-sixth and twenty-seventh of September: the crop not quite thick enough upon the ground; but remarkable “top-corn!” twenty-eight to thirty or thirty-two grains on a spike. And what makes this incident a still stronger evidence in favour of attending to the seasons for the proper time of sowing—this piece of barley, though sown later by several days than any other piece upon the farm, was (where it had not been chilled by the standing water) the *stoutest*, best barley upon it. Had this piece of barley been sown on the same days, in an early spring, it is more than probable that, instead of being the best, it would have been the worst, upon the farm. The stoutness of the straw, the length of the ears, and the plumpness of the grain (a specimen of which I have preserved), are proofs that it was *sown in season*, the fourth and fifth of June.

For general remarks on this subject, see *Experiments and Observations on Agriculture and the Weather*, p. 171.

126.

126.

SEPTEMBER 7. Last year, I put a swarm of bees into a wooden hive, of a particular construction. They took it remarkably well, and in the course of the summer laid up an ample store. But the mildness of the autumn, and the length of the spring, were fatal to a principal part of the bees in the country; and to these among the rest. Nevertheless, through inattention, I let the hive stand in its place, with the empty comb in it.

BLES.

Passing by it on the twenty-fourth of July, (the height of swarming-time this year!) I saw several bees about the mouth of the hive: but in the evening they disappeared. Next morning they returned; and, at noon, were followed by a very large swarm; which took possession of the hive; and, in a few hours, began throwing out the dead, and clearing their new habitation: a work which employed them that and the ensuing day.

Perhaps, this was a stray flight, which had settled upon some neighbouring tree; and the first were out-scouts, searching for a hollow tree, or a fissure in a rock.

Or, perhaps, they came immediately from some hive in the neighbourhood. I have been

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BEES.

since told that this circumstance frequently happens; and that it is reckoned unneighbourly, if not unlawful, to let a "dead stock" remain upon the stand. A labourer, it seems, followed one, this year, immediately from his own to a farmer's garden in the neighbourhood.

These are circumstances in the history of this petty but pleasing object of rural economy, which, though they seem to be well understood in this part of the kingdom, are not, I believe, generally known.

127.

MANURING
GRASSLAND.

SEPTEMBER 7. Last year I made two accurate experiments on the *time* of manuring grassland. One of them was made the thirtieth of *July*, presently after the hay had been carried off: the other in *October*.

The first was very decisive: the benefit was evident; though the whole crop was extremely good; at least two load an acre: but, where the dung had been set, the grass was lodged, and the swath obviously larger than it was on the unmanured parts.

But the benefit arising from that set on in *October* was by no means obvious; indeed, on
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a close inspection, I could not see any shade of difference; although the crop was in this case very moderate; not a load an acre.

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MANURING
GRASSLAND

128.

SEPTEMBER 7. (See M. 62.) Another exceedingly fine ash, which stood in the neighbourhood of that before mentioned, and which had also been disbarked, entirely round, by the deer, was blown down by the high winds of last spring.

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LANDS.

The roots were entirely rotten, and the bottom of the stem appeared, as it lay with its butt on, to be decayed; but the topwood and the bark of the stem had a healthy and sound appearance.

Nevertheless, on cutting it up, the stem proves rotten at the heart, for twelve or fifteen feet up; and is, at the bottom, a mere shell.

Therefore, notwithstanding the ash may appear healthy and flourishing after it has been barked; it is, nevertheless, decaying in the most essential part; and ought not, in point of profit, to be suffered to stand*.

* The rottenness of this tree could not be owing to a natural decay; as it had every appearance of a healthy, growing tree; and stood in a grove, which probably is not more than fifty or sixty years old; and whose trees, in general, are now in full vigour.

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TENTHREDO
OF
THE TURNIP

129.

SEPTEMBER 7. The young caterpillars are partial to the leaf they are bred in. Observing one just excluded from a leaf which is become old, withered, and yellow, with only here and there a green speck, I cut off the part on which it was feeding (thinking that a younger leaf would be more acceptable) and laid it upon a fresh young plant, in such a manner that the animal lay at its ease between the two leaves: nevertheless, it still kept feeding on the old leaf, for many hours; and, when it left it, did not begin upon the top of the tender leaf, but went down to the leaf-stalk. But on reflection, this is in consonance with nature: the animal had been nourished, while in the nidus, with the juices of the old leaf; and after its enlargement, the same juices, and those of a similar nature, were most suitable to its acquired habit. Instinct, therefore, led it to feed upon its foster plant; and to prefer the rigid to the tender part of the young leaf.

SEPTEMBER 9. The eggs deposited on Saturday the thirty-first of August, are beginning to come forth to-day; which is only the ninth day from the time of their being deposited: the leaves young, healthy, and succulent:

culent: there is, however, only one as yet excluded (six o'clock in the evening) and another which seems ready to burst forth: —the nidus, on the under-side of the leaf, being swelled to the stretch; and somewhat on one side is a large black speck; over which the leaf has a shining glossy appearance. Cut off the margin of the leaf, and shut it up in a box.

SEPTEMBER 10. This morning it is come forth, and has eaten a pit in the leaf large enough to bury itself.

Examining the leaves in the garden-pot, I find them swarming with young caterpillars, which have been excluded last night; so that ten days may be taken as a mean continuance in the egg-state.

Examining these leaves still further, I perceived one of the animals in the act of exclusion.—Cut off the part of the leaf it was in, and saw it crawl out under the glass. It began feeding in less than two minutes.

Seeing several more in, or near, the same state, cut them off with a pair of scissors, and laid them on a microscope-stand, placed in a warm sun. One, whose head was already bared, presently made its escape, and actually fed, or appeared to feed, while its tail yet remained in the nidus.

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Having not yet had an opportunity of seeing any of them in the act of breaking the shell of the nidus, I began to apprehend that the perforation was made by a simple solution of the leaf, by means of the glutinous moisture with which their heads appear to be covered (and which, no doubt, gives the leaf its glossy transparency); for in the two acts of exclusion which I had seen, the head appeared passive, with its upper part protuberant, and its mouth within the nidus; until bringing its mouth and two of its foremost feet without the orifice, it began to struggle, and soon made its escape. But, casting my eye on a neighbouring nidus, I saw a faint working within it, and presently saw its coat pierced by a tooth, or some other appendage of the mouth of the animal; which was obviously in the act of eating its way out.

Having made a perforation large enough for its purpose, it placed its head in the position above described, as if to rest itself after the fatigue it had undergone in making the doorway. In a few minutes it began to struggle, and having got its fore legs without the orifice, crept out with ease.

I afterwards observed two more perform the same operation, in the same manner, and mi-
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nuted them both :—one of them was fifteen and the other twenty minutes, from the first visible act to the final exclusion, namely, about ten minutes in making the perforation, and the rest of the time in resting, and in the labour of extricating themselves.

I am clearly of opinion, nevertheless, that the moisture, abovementioned, assists them materially in the operation, by resolving the coat of the nidus into a jelly-like matter, soft and inviting to the infant tooth; for one which, on being placed in a hot sun, began to make the perforation before the coat had sufficiently received its semi-dissolution; that is, before the livid patch was large enough; could not extricate itself, but stuck with its forehead out; while its tentacula, and fore legs, were bound in by a part of the coat, still green and rigid; and it died in this state.

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SEPT. 11. The *Midsummer shoot* of the oak, this year, has been more obvious than I recollect to have seen it. It has, however, I apprehend, been made much later than usual: it was not obviously general until the beginning of August. Many oaks have shot upwards of a foot in length.

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TENTHREDO
OF
THE TURNER

WOOD-
LANDS.

The

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MIDSUMMER
SHOOT.

The Midsummer shoot and the Midsummer barking-time have always staggered my opinion relative to a uniform motion of the sap, on Dr. Hales' principles: nor have they, I believe, ever been fairly accounted for; but remain an unanswered argument in favour of a *circulation* of the sap*.

Being struck with this year's ample shoot, I was led into a train of reflection upon this interesting subject.

The spring run of the bark and the spring shoot are the acknowledged consequences of the rise of the sap; but how similar effects should take place about Midsummer, when an *extraordinary* rise of sap cannot easily be proved, may seem difficult to explain.

If, however, we conceive a regularly ascending stream to commence on the approach of spring, and to continue rising, uniformly, until the wane of Autumn; and trace, with close attention, the effects which must necessarily be produced upon the tree by such a uniform rise of sap; we shall find them to be exactly those which annually occur in nature: namely, a spring run of the bark, succeeded by a spring shoot, with leaves, &c. a Midsummer run, with a succeeding shoot, &c.

* The *arterial* sap, if it may be so termed, which flows immediately from the root, is here to be understood.

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and, perhaps, what every year occurs in a greater or smaller degree, a Michaelmas run of the bark, with a Michaelmas shoot.

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MIDSUMMER
SHOOT.

This process of nature might be illustrated in the following manner.

Suppose four elastic vessels to be connected in regular series, with narrow communications between them; each channel of communication being furnished with an elastic valve, requiring a degree of force to open it; but, being overcome by superior pressure, its elasticity weakening, until entirely spent.

Suppose this series of elastic vessels stretched flat upon a table (representing the tree), and covered with a board (representing its bark). This would resemble the winter state of the tree, when the bark and the wood are in their nearest degree of contact.

Suppose further, a regular stream of water to be injected into the first vessel. As the water continued to flow, the vessel would swell; the board be lifted by slow degrees from the table; and in this state represent, sufficiently, the *spring run of the bark*.

The vessel being filled to the stretch, the first valve would begin to yield; the buds of the tree would burst, the leaves expand, and the *spring shoot* be protruded.

But

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SHOOT.

But the spring shoot being compleated; every twig and every leaf having received its limited size; and the stream still continuing to flow; a *second surcharge* naturally takes place; and the bark becomes, a *second time*, separated from the tree.

The stream still flowing, the second valve is opened; and a second, called the *Midsummer shoot*, necessarily follows.

The autumn proving fine, and the current of sap still continuing to rise, the second shoot arrives at maturity, and a *third overflow of sap* takes place; the third valve is burst open, and a third or *Michaelmas shoot* is the consequence.

But winter setting in, the supply of sap is stopt; and that which has already been raised, being spent on the younger shoots, carried off by perspiration, or having fallen back again to the root, the bark closes upon the wood, and the tree returns again to its winter state.

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BUILDINGS.

SEPTEMBER 21. *Hog-cisterns*, in this country, are principally built with bricks and *terrace*. But *this* is expensive: yet a hog-cistern is among the first conveniences of a farm-house. Wooden vessels are incommodious, and leaden ones dangerous.

This

This summer a receptacle for water in a brick-yard being wanted, I had one built of bricks, laid in *clay*, and surrounded with a coat of the same material : it holds water perfectly.

Afterwards, I built a hog-cistern in the same manner. This morning, on enquiry, I find that not only the tenant, but his wife and her maids, are fully satisfied with it.

It was built in this manner—A pit five feet and a half long, by four feet wide, and five feet deep, was sunk in the place most convenient to the dairy, kitchen, and hog-yard jointly.

The bottom of the pit was bedded with some extraordinarily fine clay, fetched from the sea-coast for this purpose ; moistened and rammed down ; and its surface smoothed over with a trowel. On this flooring were laid three courses of bricks, in clay-mortar (the best of the clay being taken for this purpose), and in such a manner, that the joints of one course fell in the middle of the bricks of the course below ; the whole being laid long-ways ; not crossed, in the usual manner.

The sides were carried up half a brick thick (that is, a brick in width) with mortar of fine clay ; and, in a vacancy left between the brick-work and the sides of the pit, moist clay was firmly ram-

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CISTERNS.

rammed; so as to unite as much as possible the bricks, the clay, and the sides of the pit into one solid mass; carrying the brick and clay work up together; and beating back such bricks, into the clay, as were forced forward by ramming.

The cistern when brought up level with the surface of the ground measured three feet long, two and a half feet wide, and three and a half feet deep; consequently the surrounding seam of clay is not more than four inches thick; and the stratum at the bottom is about the same thickness.

Above-ground, a nine-inch wall was raised on each side, two feet high, with a gable carried up at one end; and, on these, a span or pitched roof was set, and covered with tiles; the other end being left entirely open as a doorway.

This is an admirable covering for a cistern: A *flap* (whether it lie horizontally or sloping) being continually exposed to the weather, lets in rain-water; soon rots; and, from the manner in which it hangs, is liable every day to be split, and its hinges forced off, by the heedlessness of servants: whereas a *door*, having only a gentle fall, and being always under cover, will last a number of years.

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SEPTEMBER 21. Yesterday evening, between five and six o'clock, saw a young caterpillar slip its slough. What struck me most, was its head being of a silvery white; except its eyes (very small), which are black, as was the body. Watched the head to see it change its colour. In about half an hour, it began obviously to change to a lead-colour: at eight o'clock (two hours and a half) it was become quite dark: this morning it is entirely black.

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SEPTEMBER 22.—One of the caterpillars (full seven-tenths of an inch long) excluded the first of September (the only one living) took ground to-day: exactly three weeks from the first exclusion (two hours and a half in burrowing).

It shed its coat about the seventh, and another time, last Friday, the twentieth; and probably another intermediate time, about the thirteenth: for these excluded the ninth shed theirs about the fifteenth, and are now shedding them a second time:—four slipped yesterday; three to-day:—one of them I saw slip its slough:—the head white as above-mentioned.

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THE TURNEP

SEPTEMBER 28. Those excluded the ninth began to shed their last coat last night (five shed), which is only nineteen days from their exclusion. But they have been shut up in a warm box, and regularly fed.

These, I am positive, have shed their coats three times, at about six days distance.

Put them upon a pot of mould:—they would not take it, nor would they eat; but seemed desirous of being released from their confinement. I therefore gave them their liberty. They were remarkably active; crawling much faster now than at any preceding period of the caterpillar-state. Hitherto their business of life has been eating; now, they are in a bustle to provide themselves convenient lodging-places.

OCTOBER 16.—To try whether rain, or other water, coming in contact with the chrysaline coat, injures the animal; or, whether the coat is water-proof; I suffered a caterpillar to burrow in a garden-pot, and let it remain about thirty-six hours undisturbed. I then watered the surface plentifully, almost covering it with a sheet of water, and put a quantity into the saucer on which it stood. This

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I have several times repeated; so that if the coat be not water-proof, it must in this time be injured, and the animal drowned.

Searched for it this morning (Mr. Parkinson present); found it intire, and the coat as firm and as tough as parchment, notwithstanding the mould round it was in a state of mortar. Put it into a glass of water to wash off the loose mould: the chrysaline coat now shewed itself of a delicate silky texture, and of a cylindrical form; rounded at both ends, which were perfectly closed and exactly alike.—With some difficulty (occasioned by its toughness and tightness) I made a breach at one end; and found the animal perfectly alive, perfectly dry, and of a healthy appearance.

The season being now far spent, I despair of seeing any of the chrysalises come to the fly-state this autumn; their present state is this:

That laid up in the fold of a turnep-leaf the fourth of August, still retains its plumpness and curvature; and still, I apprehend, retains its chrysalis life.

Of the six laid up the fifteenth of August among mould, four now remain fixed to the bottom of the box.—On separating one of them, I find the coat very tender and somewhat

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broken, with only the skin of the animal remaining; not entire, but divided longitudinally; one of the divisions, or sides, being very entire, the other broken. *Query*—Has the fly escaped from this unnoticed (for during the first two or three weeks the box was frequently left open to receive the rays of the sun); or has some other animal entered the coat, and devoured the entrails of the caterpillar? —Loosening another, I find it very perfect, containing a plump, sleek, healthy-looking chrysalis.—Separating a third, it proves a fine large coat, curiously lined on the inside, with a smooth silvery lamina; but without any remains whatever of the animal, which has obviously escaped through a perforation at one end of the coat. *Query*—Did it escape in the caterpillar or the fly state? I am of opinion it made its escape presently after it had formed its coat, and was that which I found under the turnep-leaf (see back); for there were only six caterpillars put into the box, and there have been six coats formed: it is, therefore, probable, that each formed its respective coat, and that two of them made their escape. The other coat, seemingly perfect, and, I apprehend, containing a chrysalis, still remains fixed to the bottom.

That

That formed the twenty-fifth of August, with mould upon a slip of paper, still remains a perfect coat, adhering closely to the paper.

Those which burrowed in the garden-pot: while warm weather continued, the pot was placed in the sun: it has since stood near the fire; so as to receive a considerable degree of warmth; but nothing, I believe, has yet come forth. Two or three of them being marked, I have searched for them, by digging up the earth carefully, and breaking the lumps between the fingers: this I have found a nice and difficult business, and the first I unfortunately crushed between my fingers.

On separating and adjusting the parts, however, I can clearly perceive the head with its antennæ folded back; its palpi, and legs, perfectly formed; its scutuli (or black shields upon the shoulders) of their full size and proper colour; as is the head; but the antennæ and legs and palpi are still white, and appear limber, and not yet hardened. I cannot, however, find any traces of wings: there are some fragments of a hardish substance; green within, and brown without; which may be the wings stuck to the slough of the caterpillar; but I am not certain.

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Being willing to sacrifice another to my curiosity, I have searched for and found another coat; but only one-half of the slough of the caterpillar remains; divided longitudinally as before.

The garden-pot now contains— one burrowed on Sunday twenty-fifth of August; one on Monday twenty-sixth of August; and three or four which have burrowed since that time, not minuted. I now put the pot by, with the glass over it to prevent escapes*.

From these circumstances, from the fresh flight of flies which appear to spring up in the middle of summer, as well as from the assertions of more than one farmer, who say, that having shut the caterpillars up in boxes they came to flies (the particulars I have not learned); it appears to me more than probable, that the early broods pass through the several changes, and arrive at the fly-state, in the course of the summer: while, from the state in which several of the chrysalises above-noticed still remain, as well as from the scattered flights of flies which every year are observed to make their appearance in the spring,

* Leaving the country, a short time afterwards, I had not an opportunity of noticing the event.

it appears to me equally probable that the latter broods lie in the chrysalis state through the winter; and that such as escape destruction from birds, insects, and the uncertainty of seasons in this climate, rise in the fly-state the ensuing spring. Further, it seems probable, that in the more northern climates, where the summer is short, the entire brood lie in the chrysalis-state through winter; which being rigid, and the spring usually setting in abruptly, the chrysalises are locked up free from injury, and the flies at once rise upon the wing; forming those cloud-like flights, which, when the wind happens to blow a sufficient length of time invariably from the north-east, have been seen to arrive, or which may with every degree of probability be brought, upon the eastern coast of this island.

It is, I believe, known that Tenthredos in general are gregarious; hanging together in flights: from repeated observations I know that the species under consideration will live from five to ten days without food.—The distance from the southern cape of Norway to the coast of Norfolk is not five hundred miles.—It has been calculated that a balloon has been carried, *by the wind alone*, at the rate

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of fifty miles an hour : consequently, a flight of insects, even supposing them to make no use of their wings to impel them forward, might be brought from Norway to this coast in ten hours. In one week they might, provided their wings could bear them, be brought to us from the most eastern confines of the Russian empire.

If no exotic flights arrive, the few which survive the winter, here, escape in a manner unnoticed, and the plants receive no perceptible injury : but, when to these the foreign swarms are added, their progeny become too powerful for the plants ; and the devastation becomes conspicuous and alarming ; producing that dreadful calamity to this country, “ A CANKER YEAR *.”

* Were an apology for the length of this and the foregoing Minutes on this subject to be required, I should make the following : Finding, on the perusal of these Minutes, that I was possessed of a minutial detail of facts, relative to the history of an insect, which has been imperfectly attended to by naturalists ; but which is of the greatest importance to the agriculture of this country ; more especially of the District whose practice I wish to describe with accuracy and minuteness ; I did not hesitate in my determination to publish them entire. I determined with greater readiness as I have found, since those observations were made, that the destruction caused by this alarming insect, has, in some well-cultivated districts, thrown a

damp

133.

133.

WHEAT.

OCTOBER 16. (See MIN. 13.) To endeavour to ascertain the truth of this opinion, I had a small bush of the *berbery plant* set, in February or March last, in the middle of a large piece of wheat.

I neglected to make any observations upon it until a little before harvest; when a neighbour (Mr. John Baker, of South-Reps) came to tell me of the effect it had produced.

The wheat was then changing, and the rest of the piece (about twenty acres) had acquired a considerable degree of whiteness (white wheat); while about the berbery bush there appeared a long, but somewhat oval-shaped, stripe, of a dark livid colour, obvious to a person riding on the road at a considerable distance.

The part affected resembled the tail of a comet, the bush itself representing the nu-

damp upon the cultivation of a valuable object of rural economy, which will not readily be removed. And I flatter myself that the expedients, here registered, for checking or removing the evil, will not be less useful to the agricultor, than a sedulous adduction of facts, relative to the migration and propagation of insects, will be interesting to the admirers of the economy of nature.

A a 4

cleus;

133.

BERBERY
PLANT.

cleus; on one side of which the sensible effect reached about twelve yards; but on the other, not more than two yards; the tail pointing towards the south-west: so that probably the effect took place during a north-east wind.

At harvest, the ears near the bush stood erect, handling soft and chaffy; the grains slender, shrivelled and light.—As the distance from the bush increased, the effect was less discernible, until it vanished imperceptibly.

The rest of the piece was a tolerable crop; and the straw clean, except on a part which was lodged; where the *straw* nearly resembled that round the berbery; but the *grain* on that part, though lodged, was much *heavier* than it was on this, where the crop stood erect.

The grain of the crop, in general, was thin-bodied; nevertheless, ten grains, chosen impartially out of the ordinary corn of the piece, took twenty-four of the berberied grains, chosen equally impartially, to balance it! so that, supposing the crop in general to be worth five pounds an acre, the part injured by the berbery would barely be worth forty shillings; the quality, as well as the quantity, being much inferior.

To try whether the vegetating faculty of these grains was destroyed or not by the damage

damage

damage the farinaceous part of them had received; I sowed, Wednesday fourth of September, three grains of the heavy, and as many of the light, in a garden-pot. Thursday nineteenth of September, one of the light grains came up; but none of the other until Thursday the twenty-sixth, when one of the heavy ones made its appearance: and on Tuesday second of October, another of the heavy grains broke ground.

To-day, turned the mould out of the pot: found the other heavy grain, and *one* of the light ones; both of them sprouted.

It is, therefore, proved that, notwithstanding the injury done to the farinaceous part of these grains, their vegetative virtue is not *wholly* destroyed.

134.

OCTOBER 26. *Bullock-fair of St. Faith's.* Bullocks, this year, have been dearer than they were even last year (see MIN. 27.). The first day of this fair (the 17th instant), ten to twelve pounds a head was asked for bullocks; but good ones have since been bought for seven to nine pounds. Bullocks which will fat to fifty stone, may now be bought for seven pounds.

This

133.

BERBERY
PLANT.

MARKETS.

133.

FAIR OF
ST. FAITH'S.

This morning, I saw ten two-year-old Isle-of-Sky Scots, drawn out of a lot of two hundred, at two guineas and a half a head. Very small: not larger than the ordinary yearling-calves of the larger breeds of cattle.

135.

FENCES.

OCTOBER 28. This morning, I observed some workmen fencing a rick-yard with furze-faggots, alone:—a species of fence I have not met with before.

In a trench, about eighteen inches wide, and six inches deep, they set the faggots, as close as possible, upon their ends; spreading the bottoms; and covering the skirts with the loose mould dug out of the trench; also with that of a narrow trench, (a spade's width) dug for the purpose, on each side; treading the mould firm to the roots of the faggots; which being sufficiently loaded, the trenchlets were shoveled and the banks smoothed.

One of the labourers says, he has set a furze-fence in this manner across Gresham-field (an exposed situation) which has stood one or two winters.

Calculate the expence thus:—One hundred and twenty faggots set about eight rods; expence

pence

pence of cutting two shillings and sixpence, or about fourpence a rod. Expence of setting about threepence a rod more: together sevenpence a rod.

135.
FURZE-FAG-
GOT FENCE.

The value of the furze, after having stood a year, will be about six shillings a hundred; or ninepence a rod.

Furze-faggots, thus placed, are a fence against every kind of stock; even hogs and hares; and, in a country over-stocked with the latter, might frequently be used, as a temporary fence, with great advantage.

136.

OCTOBER 31. Yesterday, procured the following particulars of the expences upon Norwich marl, brought round by Yarmouth, and landed at the staiths, at Wood-Bastwick.

MARLING.

Cost of a chaldron (*weighing* a chaldron of coals) at Thorp, and putting it on board the lighters eightpence; lighterage to Wood-Bastwick, round by Yarmouth, fifty miles, sixteen-pence; together, two shillings a chaldron. Two chaldrons make a middling cart-load; two chaldrons and a half a good load: seven or eight large loads are esteemed sufficient for an acre: the expence upon which stands thus:

The

136.	The marl, (suppose eighteen chal-	£. s. d.
MARLING,	drons) at two shillings - - -	1 16 0
	Filling it at the staith; carting to a medium distance, and spreading about, fifteen-pence a load, -	1 2 6
	Expençe per acre, - - -	£.2 18 6

With the marl ought to be, and frequently is, laid on a quantity of Yarmouth muck, equal, in expence, to the marl.

After this dressing, for about ten years, the soil (a sandy loam, but stronger and deeper than the Norfolk soil in general) throws out very great crops; and, with the usual teathe and ordinary dungings, will feel the effect of the marl for ten years longer.

Before the use of marl (which has not been brought by water, I apprehend, above ten or fifteen years) the farmers could grow no turneps; the land letting for ten or twelve shillings an acre: now, the turneps upon it are remarkably fine; and the land lets at full twenty shillings an acre: a rent the occupiers could not pay, were it not for marl.

The distance between Wood-Bastwick and the marl-pits at Thorp next Norwich, is not,

by

by land, more than six or seven miles; yet, the farmers find it cheaper to fetch their marl fifty miles by water, and then carry it, perhaps, half a mile from the staith to the ground, than fetch it these six or seven miles by land. What an advantage, *in some cases*, is water-carriage to a farmer; and, consequently, to an estate.

136.

WATER-
CARRIAGE.

I 37.

OCTOBER 31. I have lately obtained the following particulars respecting the recent *inclosure at Felbrigg*.

INCLOSURES

Some seven or eight years ago, Mr. Wyndham, who is Lord of the Manor, was also (in effect) the sole proprietor of this parish; excepting one small farm, of seventy pounds a year, belonging to a young man, a yeoman, just come of age.

An extensive heathy waste, and some common-field lands, were desirable objects of inclosures: consequently, the possession of this young man's estate became an object of importance to Mr. Wyndham.

Steps were accordingly taken * towards obtaining the desired possession: not, however, by

* Through the mediation of Mr. Kent; whose ability, as an estate-agent, is deservedly applauded in this District.

threats

137.
INCLOSURES

threats and subterfuges, too commonly but very impolitically made use of upon such occasions; but by open and liberal proposals to the young man, the joint proprietor; who was made fully acquainted with the intention; and frankly told, that nothing could be done without his estate. He was, therefore, offered, at once, a specific and considerable sum, over and above its full value to any other person: and, to ensure the object in view, he had, at the same time, an offer made him of a considerable farm, on advantageous terms.

The young man, being enterprising, and his little estate being, I believe, somewhat encumbered, accepted the offer, sold his estate, and agreed for a farm;—consisting partly of old inclosure;—in part of common-field land; and, in a still greater proportion, of the heath to be inclosed.

Mr. Wyndham (whose virtues and abilities are publicly known) having thus (*in effect as to this inclosure*) got the entire parish into his possession, and having set out the least fertile part of the heath, as a common, for the poor to collect firing from,—he parcelled out the remainder to different tenants,—laid out roads and driftways, and divided the whole, whether
heath

heath or common-field, into inclosures of eight to twelve acres each; or agreeably to the desire, or conveniency, of the intended occupiers.

137.
INCLOSURES

A principal part of the heath-land was laid to the farm of Mr. Priest, the young man above-mentioned; and was let to him on the following terms.

Landlord agreed to raise fences, hang gates, build a new barn upon a large scale, make other alterations, and put the whole of the buildings into thorough repair.

The tenant agreed to marl twenty acres every year, until the whole should be marled, at the rate of twenty cart-loads an acre.

The rent agreed upon was this. Nothing until it has been marled three years. The fourth year, after marling, the rent to commence at three shillings an acre: at which to continue four years; and then (namely, the eighth year after being marled) to rise to seven shillings and sixpence an acre: and at this rent to remain until the expiration of the term of twenty-one years.

It was also further agreed that the tenant should be paid for the carriage of the materials of the new barn; but should do that for the repairs and alterations, gratis; as also for the subsequent

137.
INCLOSURES

subsequent repairs during the term. Also that tenant should pay half the expence of workmen's wages for the subsequent repairs; provided that such moiety do not exceed five pounds in any one year.

This was a liberal agreement on the part of the landlord, and, on a cursory view, may seem to give extravagant encouragement to the tenant. The following calculation, however, will shew that, in the end, the plan will turn out highly advantageous to the landlord:

Suppose, for the sake of calculation, the quantity of heath-land, let to this tenant, to be exactly three hundred acres: and that these three hundred acres are divided into thirty inclosures of ten acres each; with a public road, or a driftway, between each line of inclosures. This is sufficiently near, if not exactly, the fact upon Felbrigg-Heath.

In this case, every inclosure required to be fenced on three sides.

Ten acres contain one thousand six hundred statute rods. The square root of one thousand six hundred is forty; consequently each inclosure, supposing them to be exactly square, required one hundred and twenty statute rods of fencing.

The

The price given for ditching, planting the quick, and hedging, was eighteen pence each long rod, of seven yards. An hundred and twenty statute rods contain about

137.
INCLOSURES

95 long rods, which, at 18*d.* is - 7 2 6

4,500 quicksets, at 3*s.* 6*d.*—15*s.* 9*d.*

—furze-feed, 4*s.* 3*d.* - - 1 0 0

£. 8 2 6

For fencing 30 inclosures, at 8*l.* 2*s.* 6*d.*

each, reckon - - - 250 0 0

— 50 gates, with posts, irons and

hanging - - - 50 0 0

— the barn (very spacious) suppose - 200 0 0

— additions, alterations and repairs 100 0 0

£. 600 0 0

— compound interest on this sum, in

21 yearly payments, at 4 per cent. 700 0 0

£. 1300 0 0

The rents to be received, during the term, supposing twenty acres to be marled yearly, would be these :

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B b

1 year

137.

INCLOSURES

1 year	-	0	0	0	Forward	153	0	0			
2	---	-	0	0	0	12 year	-	49	10	0	
3	---	-	0	0	0	13	---	-	57	0	0
4	---	-	3	0	0	14	---	-	64	10	0
5	---	-	6	0	0	15	---	-	72	0	0
6	---	-	9	0	0	16	---	-	79	10	0
7	---	-	12	0	0	17	---	-	87	0	0
8	---	-	19	10	0	18	---	-	94	10	0
9	---	-	27	0	0	19	---	-	99	0	0
10	---	-	34	10	0	20	---	-	103	10	0
11	---	-	42	0	0	21	---	-	108	0	0
			<hr/>						<hr/>		
			153	0	0				967	10	0

As the compound interest of the
 above receipts set down - - 232 10 0

 £. 1200 0 0

Thus it appears, from this calculation, that, on the supposition of the articles of agreement being strictly adhered to, the landlord will be paying at the expiration of the term one hundred pounds as the purchase-money of three hundred acres of *improved land*, worth from ten to fifteen shillings an acre; the principal part of this allotment being a good loam, lying on the desirable subsoil, an absorbent brick earth.

But

But the fact is, and was probably foreseen, that the tenant, instead of marling twenty acres annually, according to the letter of the agreement, marled, I think he told me, upwards of one hundred the first year, and has now nearly finished the whole.

Therefore, supposing the original six hundred pounds, and the first seven years interest; to have been taken up, the landlord would, at the end of the term, have cleared off the incumbrance, and have found some hundred pounds in his pocket; beside the fee-simple of one hundred and fifty to two hundred pounds a year, from this allotment only; beside the advantages arising from the remainder of the heath, and the inclosure of the common field; and besides having done away a nuisance, and planted industry and plenty upon an almost useless waste: and this, too, without rendering himself odious, or his tenants miserable. IMPROVEMENTS like this are *real*, and bring a *permanent* increase to the rent-roll of an estate.

END OF THE MINUTES.

177
MEMORIALS

But the fact is, and was probably foreseen, that the count, instead of making any more than usual, was only to the letter of the agreement, I think he told me, upwards of one hundred the first year, and has now nearly finished the whole.

Therefore, supposing the original six hundred pounds, and the first seven hundred, to have been taken up, the hundred would at the end of the term, have cleared off the mortgage, and have lodged some hundred pounds in his pocket; besides the five-hundred of one hundred and fifty to two hundred pounds a year, from this allotment only; besides the advantages arising from the remainder of the land, and the produce of the common fields; and besides having done away a nuisance, and planted industry and plenty upon an almost sterile waste; and this, too, without seeking himself either, or his tenants, miserable, but servants like this, are well deserving a permanent interest in the result of an estate.

PROVINCIALISMS

PERTAINING TO THE

RURAL ECONOMY OF NORFOLK.

THE languages of Europe are not more various, or scarcely more different from each other, than are the dialects of husbandmen in different Districts of this Island.

The practice of a given District, therefore, can only be studied in the dialect of that District. No conversation can be carried on without its assistance. And although a man of observation may, by observation alone, make himself master of the outline and principal features of practice; yet for the minutia, he will find it convenient, and frequently necessary, to have recourse to *conversation*.

But a mere practitioner will not communicate with a man who does not speak his lan-

guage in its provincial purity: taking for granted, that he is as ignorant of the subject in general, as he happens to be of *his* merely provincial terms. One word awry is capable of putting an end to the most interesting conversation; and of giving the practitioner such an opinion of the observer, as to consider him in future, either beneath his notice, or above his comprehension.

The first step, therefore, to be taken by a man who is desirous of studying the practice of a District is to gain a knowledge of its provincial language: for until this be obtained, in some certain degree, he cannot join profitably in conversation with those who are best able to clear up his doubts, and lead him on to fresh discoveries.

To acquire with greater readiness, and retain with greater ease and certainty, this necessary knowledge; and to indulge, at the same time, an inclination to an enquiry into the origin and progress of the English language; I registered the provincialisms of the District with the same assiduity I did its practice; and find myself possessed of near a thousand deviations from the established language.

But

But the major part of those provincialisms do not relate especially to rural affairs; but belong to the ordinary dialect of the country; and cannot, with propriety, be introduced here. I have therefore selected such, only, as pertain to the subject of these volumes. I have, however, made the selection as ample as this line of conduct would admit of—for several reasons.

Such a selection will, in the instant, serve to throw additional light upon the present volumes; and may, hereafter, be found useful to those who may have occasion to study on the spot, the rural economy of the District.

Other more material benefits may arise from a collection of Glossaries of the provincial terms of different and distant Districts: such Glossaries may serve to elucidate passages in the EARLY WRITERS, on rural subjects, which, without their assistance, might remain inexplicable. And, above all, they may be serviceable in ascertaining the particular Districts in which they severally wrote: a circumstance, at present, little known; though most essentially necessary in fixing the degree of credit which is due to their respective works.

A.

A-LADY. Lady-day (in common use).

ANBURY. A disease incident to turneps.

See vol. ii. p. 33.

B.

BARNED. Houfed in the barn (a simple proper term).

BATTONS. Strong broad fencing rails. See vol. i. p. 85.

BARN-YARD. Straw-yard ; fold-yard (a good term).

BECK. A rivulet (invariable).

BEGGARY. Land let down, through a want of proper manure and tillage, is said to be "run to beggary."

To BESTOW. To flow away.

BINS. Applied, provincially, to the receptacles of straw in a farm-yard ; cow-cribs.

BLUNK OF WEATHER. A fit of squally tempestuous weather.

BOKE LOAD. A large top-heavy, bulky load.

BRAND. Smut (in common use).

BRANDY. Smutty (also common).

BRANK. Buck (used only in the southern hundreds).

BRECK. A large new-made inclosure (a Break).

BROADS. Fresh-water lakes (that is, *broad waters* ; in distinction to *narrow waters*, or rivers).

BUCK. *Polygonum fagopyrum*. See vol. i. p. 126.

BUCKSTALLING. Cutting hedge-thorns fence-height. See vol. i. p. 101.

BUDDLE. *Chrysanthemum segetum* ; corn-marigold.

BUDS. Yearling cattle.

BULLOCKS. See vol. i. p. 337.

BULLS,

- BULLS. The stems of hedge-thorns.
 BURGOT, or BEERGOOD. Yeast.
 BUSH-DRAINING. Underdraining (being done
 with bushes).

C.

- CANKERS. Caterpillars.
 CANKERWEED. *Senecio jacobæa*; common rag-
 wort.
 CANSEY. Causeway.
 CANSH. A small mow.
 CAST. Yield; applied to corn-crops.
 CAULK. Hard chalk; or, perhaps, chalk in general.
 CHEARY. Careful; sparing; choice.
 CHICKED. Sprouted; began to vegetate, as seed
 in the ground, or corn in swath or "shuck."
 CHINGLE. Gravel, free from dirt.
 CHOAKED. Blown up, or sufflated, with a turnep in
 the throat.
 CLOTE. *Tussilago farfara*; coltsfoot.
 COBS. Sea-gulls.
 COCKEY. The grate over a common sewer. Hence,
 probably, Cockey-lane, in Norwich.
 COCKSHEADS. *Plantago lanceolata*; plantain-rib-
 wort; rib-grass.
 COLDER. See STOVER.
 COOMB. Four bushels; half a quarter.
 COSH. The husk or chaff of wheat and oats.
 COTTS. Lambs brought up by hand; cades.
 COVEY. A cover of furze, &c. for game.

COW-

- COW-PAR. Straw-yard ; fold-yard.
- A CRINGLE. A with, or rope, for fastening a gate.
- To CRINGLE UP. To fasten with a cringle.
- CROFT, or CRAFT. A small common field. See vol. i. p. 8.
- CRONES. Old ewes. See vol. ii. p. 28.
- CROOM, or CROME. Any thing hooked ; as muck-croom, turnep-crome.
- To CROWD. To wheel in a wheel-barrow.
- CROWDING-BARROW. A wheel-barrow.

D.

- DABBING. Dibbling.
- DANNOCKS. Hedging-gloves.
- DAUBING. Plaistering with clay.
- DAUBY. Clammy, sticky ; spoken of land when wet.
- DAVYING. See vol. ii. p. 257.
- DICK. The mound, or bank of a ditch.
- DICK-HOLL. The excavation, or ditch itself.
- DINDLES. *Sonchus oleraceus* & *arvensis* ; common and corn sow-thistles : also, the taller hawkweeds.
- DITCHING. A general term for fencing with hedge and ditch.
- DODMAN. A snail.
- DOGGEDLY. Badly ; shamefully done.
- DOLE, or SEVERAL. A piece of land upon a heath or common, off which only one particular person hath a right to cut fuel.
- DOLE-STONE. A landmark, or boundary-stone.

To DOSS. To strike with the horn, or gore slightly,
as cattle frequently do each other.

DOW, or DOO. A dove, or pigeon (common).

DOWLER. A dumplin (common).

DRAINS. Brewers' grains.

DRUG. A four-wheeled timber carriage.

DRY. Drought: "the crop was caught in the dry."

DYDLE. A kind of mud-drag.

F.

FALL-GATE. A gate across a public road.

FAT-HEN. See MUCKWEED.

To FEY, or FAY. To cleanse,—whether a well, a
pit, or corn.

FICKELTOW. The fore-tackle, or carriage, which
supports the plowbeam.

FLAG. The furrow turned.

FLAGS. Turves, or fods.

FLIGHT,—of BEES,—the proper term for a *swarm*
of bees.

To FLITCH. To move from place to place; as from
farm to farm.

FLUE. The coping of a gable or end-wall of a house.

FOLLOWERS. Lean store-cattle or sheep, which
follow the fattening-bullocks. See vol. i. p. 29c.

FORCING. Fattening.

FOREIGNER. A stranger; one of another county;
not of the neighbourhood.

To FORGIVE. To thaw.

- FOURINGS.** An afternoon-meal in harvest.
- FULL-PITCH.** Plowing the full depth of the soil is called "taking it up a full-pitch."
- FURLONG.** The line of direction of plowed lands.
See vol. i. p. 131.
- FURS.** Furzes.
- G.
- GAIN.** Handy; convenient; docile. *Ungain*, the reverse (much in use).
- GARGUT, or GARGET.** A disease incident to calves. See vol. ii. p. 125.
- GARGUT-ROOT.** The root of *Helleborus foetidus*; bear's-foot.
- GATHERING.** Rolling corn-swath into cocks or bundles.
- GAY.** Gaudy; as speckled, light-coloured cattle.
- GEER.** Stuff; thing (a general term).
- GILL.** A pair of timber-wheels.
- GLADDON, or GLADDEN.** *Typha latifolia* & *angustifolia*; large and small cats-tail.
- GOOSE-TANSEY.** *Potentilla anserina*; silverweed.
- GOTCH.** A jug or pitcher (in common use).
- To GRAZE.** To fat.
- GRAZIERS.** Fatters of cattle; whether their food be grass, turneps, or oil-cake.
- GREASY.** Foul; grassy: spoken of fallows or other plowed grounds.
- The GRISSONS.** The stairs, or stair-case.
- GROWERS.** Farmers. *Great growers*, capital farmers.

GRUB-

GRUB-FELLING. The common method of taking down timber-trees. See vol. i. p. 123.

GULPH. A mow, or bay-full, in a barn.

GULPH-STEAD, GOAFSTEAD, or GO-STEAD. A bay, or division of a barn.

H.

To HAIN. To raise, or heighten; as, "to hain the rent, the rick, or the ditch."

HAKES. The copse or draught-irons of a plow. Also pot-hooks.

HARDS, or HURDS. Tow.

HARVEST-BEEF. A general term for butchers meat eaten in harvest, whether it be beef or mutton.

HAUGHTY WEATHER. Windy weather.

A HAY. A clipt hedge (common).

HEAD. Bullocks are said *to go at head*, when they have the first bite; in distinction to those which *follow*.

HEAD-KEEP. The first bite: the best the farm will afford.

HECK. A half door.

HECKFOR. Heifer.

HELVE. Applied to handles in general.

HIGHLANDERS. Scotch cattle of the Highland breed.

HILD. Lees or sediment of beer.

HILDER. Elder.

HOBBIDY. A man-boy (used in common).

HOBBY. A hack (in common use).

HOGWEED. *Polygonum aviculare*; knotgrass.

HOLL,

HOLL, or **HOL**. The hollow of the ditch, in distinction to the "dick" or bank of the ditch.

HOMEBREDS. Cattle of the Norfolk breed.

To HORN. To gore, or wound with the horns.

HORSE-BRAMBLES. Briars; wild rose.

HORSE-TREE. Whippin; or swingletree.

HULVER. Holly. *Hulver* *cop* *is* *the* *name* *of* *the* *holly* *in* *the* *west* *of* *England*.

A HURRY. A small load of hay or corn.

I. & J.

A JAM. A vein or bed of marl or clay.

To JAM. To render firm by treading; as cattle do land they are foddered on.

JIMMERS. Door-hinges (common).

INWARDS. Intrails; intestines.

To JOLL. To job with the beak; as rooks *joll* for worms; or for corn recently sown.

JOURNEY. Half a day's work at plow or harrow.

K.

KEEPING-ROOM. A sitting-room.

KERNELS. Grains of wheat, &c.

KIDS, or **KID**. Faggots; bavins.

KILLER. A small shallow tub; a small cooler.

KNACKER. Used in common for collar-maker.

L.

LAID. Just frozen. When water is slightly frozen over, it is said to be *laid*.

LANNIARD. The thong of a whip.

LASH,

LASH, or LASHY. Very wet; as "cold lashy weather."

LAYER. Plants of hedgewood; quick.

To LATCH. To catch as water, &c.

To LECK-ON. To add more liquor; as in brewing.

LEGGET. A tool used by reed-thatchers.

LIFT-GATE. A gate without hinges, being lifted into notches in the posts.

LIFTING. (Corn in swath.) See vol. i. p. 242.

LOBSTER. A fote.

LOKE. A close narrow lane (common).

LOWER. A lever.

LUMPS. Barn-floor bricks.

M.

MANNER. Rich mould of any kind collected for the purpose of mixing with dung.

MARRAM, or MAREM. *Arundo arenaria*; sea-reed-grass.

MARSHES. Fens and swamps come under that denomination in Norfolk. See vol. i. p. 320.

MARSHLANDERS. Cattle of the marshland or short-horned breed.

MAVISH, or MAVIS. The thrush.

MAUL. A mallet.

MAUTHER. A little girl (in common use).

MEADOWS. Low, boggy, rotten grassland.

MEATY. Flethy, but not "right fat."

MERGIN. The mortar or cement of old walls. See vol. i. p. 30.

To MOYS. To thrive: spoken of crops and stock; also in a general sense; as, "he muddles on but does not moys."

MUCK. The provincial and proper name of what is more commonly, but less properly, called dung.

MUCK-WEED, or FAT-HEN. *Chenopodium album*; common goose-foot.

MUDCROOM. A tool used by water-workers. See vol. ii. p. 79.

MURRAIN. See GARGUT.

N.

NEEDLEWEED. *Scandix pecten Veneris*; shepherd's needle.

A NIP. A near, split-farthing house-wife.

A NOCKLE, or KNOCKLE. A mallet or beetle.

NOGG. Strong beer (common).

NONSUCH, black. Trefoil-feed.

————— *white.* Rye-grass-feed. See vol. ii. p. 179.

NOONINGS. Workmen's dinner-time.

O.

OAMY. Light, porous, floury; spoken of plowed land.

OLLAND. Lay-ground (old land).

OPEN. Not spayed; spoken of a heifer, or a sow.

OVER-YEAR. Bullocks which are not finished at three years old, if homebreds—or the first winter after buying

- buying, if purchased—but are kept through the ensuing summer, to be fatted the next winter, are said to be kept *over-year*; and are termed *over-year* bullocks.
- OUTHOLLING. Shovelling out a ditch for the manure it contains. See vol. i. p. 76, and 101. and vol. ii. p. 76.
- CWLSCROWN. *Gnaphalium sylvaticum*; wood cudweed.

P.

- PACK-WAY. A bridle road (common).
- PADS. See PEDS.
- PAN. The flooring on which the cultivated soil lies. See vol. i. p. 11.
- PAR-YARD. Straw-yard; fold-yard.
- PAVEMENTS. Square paving-bricks; flooring-bricks; paving-tiles.
- PEDS, or PADS. Panniers.
- PETMAN. The last of the fare.
- PETTY SESSIONS. See vol. i. p. 40.
- PICKPURSE, or SANDWEED. *Spergula arvensis*; common spurrey.
- PIGHTLE, or PYKLE. A small inclosure; a croft.
- PLANSHER, or PLANCHER. The chamber-floor.
- PLAT. The mould-board of a plow.
- PLOWJOGGER. A plowman.
- PLOWS. Plowed ground; whether closes, or pieces in open fields.
- POLLARDS. Trees headed down to the stem, and cropped or polled, from time to time, for fire-wood. A term general to the southern and eastern counties.

POLLER, or POLLEN, or HEN POLLEN. The hen-roost.

PULK. A puddle.

PUTT. A mole-hill (in common use).

To PUT. To stumble, as a horse.

Q.

QUARTERS. The inn a farmer uses at market, &c. is called his *Quarters*: and he is said to *quarter* at such an inn.

QUICKS. *Triticum repens*; couch-grass.

R.

RANNY. The little field-mouse.

RAFTY. Damp and musty; as corn or hay in a wet season.

REDWEED. *Papaver rbeas*; round-smooth-headed poppy.

To REAVE. To unroof or disturb the roof.

RED-ROW. When the grains of ripening barley are streaked with red, the crop is said to be in the *red-row*.

REED-RONDS. Plots, or beds of reed: or, the swamps which reed grows in.

RICEBALKING. A particular method of plowing.
See vol. i. p. 142.

A RIDE. A common name for a saddle-horse.

RIGG. Ridge.

RIN. Brine.

RINGES. Rows, of hay, quicks, &c.

ROADING. Running races with teams, upon the road. See vol. i. p. 44.

ROKE.

ROKE. Mist, or fog.

ROOFING. The ridge-cap of thatched roofs.

To ROPE. To tedder; as a horse.

ROWEN. After-grafs; latter-math.

S.

SANDWEED. See PICKPURSE.

SCAITHFUL. Given to breaking pasture. Also, liable to be over-run by stock; as open fields, &c.

SCALDS. Patches of land which are more liable to be *scorched*, *burned*, or *scalded* in a hot season, than the remainder of the piece they are situated in.

To SCALE-IN. To plow in with a shallow furrow.

SCORING; or, SCOWRING. See vol. i. p. 139.

SCOTCHES. Scores, or notches.

SCOTS. Scotch cattle.

SEEL, or SEAL. Time or season; as, "hay-feel," hay-time; "barley-feel," barley feed-time; wheat-feel," wheat feed-time: "bark-feel," the barking season. Also, used sometimes in common conversation; as, "what feel of day is it?"

SEVERAL. See DOLE.

SHACK. Stock turned into the stubbles after harvest are said to be at *shack*. Grounds lying open to common fields are said to "lie quite shack."

SHACKING. A shabby rambling fellow (living at shack).

To SHEAR. To reap; as wheat.

SHELLED. Picd; party-coloured.

SHIFTS. Parts of a farm allotted for the reception of stock or crops. See vol. i. p. 131.

SHOTS. Young store-swine.

SHUD. Shed.

To SHUG. To shake; as hay, &c.

SHUGGINGS. That which is shed or scattered, as corn at harvest.

SHY. Harebrained; high-mettled; head-strong; as wild colts, &c.

SINGULAR. Loac or single; as a singular house, or farm.

SKEP. A coarse round farm-basket; also a bee-hive.

SLADE. Sledge.

To SLADE DOWN. To draw back part of the mould into the interfurrow, with the plow dragging, or *slading* upon its side.

SLAKE. Leisure: "to be at slake," to be at leisure.

SLOBBERERS. Slovenly farmers.

SLOB-FURROWING. A particular method of plowing. See vol. i. p. 142.

SLUSS. Mud; mire.

SMARTWEED. *Polygonum hydropiper et Pennsylvanicum*; biting and pale-flowered perficarias; arsmart.

SNAIL-HORNED. Having short down-hanging horns, with blunt points, and somewhat bent, in the usual form of the snail; spoken of cattle.

To SOL. To pull by the ear, as a dog pulls a sow.

SPARKLING. Claying between the spars to cover the thatch of cottages (spar-claying).

SPIRKET.

SPIRKET. A hook to hang things on.

SPOULT. Brittle; spoken of wood, &c.

SPURWAY. Bridle-road.

SQUALLY. A crop of turneps, or of corn, which is broken by vacant unproductive patches, is said to be squally.

To SQUINDER. To burn inwardly; as charcoal and the ashes of fern, &c. are burnt.

STANDS. Young timber-trees under six inches timber girt, or twenty-four inches in circumference.

STARK, or STUCK. Tight, or stiff.

STATESMEN. Yeomen; small owners.

STOCK. Species of a crop. See article **TURNEPS**, &c.

STONDLE. A bearing tub.

STOPS. Small well-buckets.

STOVER. A general term for the different species of fodder arising from thrashed corn, whether it be straw, chaff, or "colder;" a provincial term for the short straws, ears, and rough chaff, which are separated from the corn-in-chaff, by the rake and the riddle, after the straw is shook off the floor; and which, in every country, has a provincial term assigned it; but totally different in different Districts.

To STOW. To confine; as cattle in a yard or pound.

STUBWOOD. All wood which grows in hedgerows and does not come under the denomination of "timbers," "pollards," or "thorns," is called "stubwood."

STULP. A post of any kind.

- SUCKLING. *Trifolium repens*; white clover.
- SUMMERLY. A turnep fallow. *A backward summerly*; an autumnal wheat-fallow: *a right-out summerly*; a whole year's fallow.
- SWALE. Shade.
- SWAYS. Rods, or switches.
- SWINGLE. A crank.

T.

- TACK. Substance, solidity, proof; spoken of the food of cattle and other stock.
- TAR-ROPE. Rope-yarn; the thread of old cables, &c.
- TASKER. A thrasher.
- TEAMER. A team of five horses.
- TEAMERMAN. A waggoner, carter, or driver of a teamer.
- TEATHE. The dung, &c. of cattle. See vol. i. p. 33.
- THAPES. Gooseberries.
- THIGHT. Applied to turneps or other crops,—close, thickset: applied to roofs or vessels,—impervious—opposed to leaky.
- THACK. Thatch: *thackster*, thatcher.
- THONE, or THONEY. Damp, limber, as under-dried hay.
- To TOP-UP. To finish highly; as fattening bullocks.
- TRIP. Of sheep;—a small flock.
- TURF. Peat.
- TWO-FURROWING. Double plowing; trench-plowing; fod-burying.
- VALLEY.

V.

VALLEY. Any small hollow or channel; as a gutter in a roof.

VANCE-ROOF. The garret.

VARDLE. A common eye or thimble of a gate, with a spike only.

U.

UNCALLOW. The earth which covers a jam of marl.

UNDER-CORN. Short, weak, underling corn, overhung by the crop.

W.

WALLACE. The withers of a horse.

WARBEETLES. The large maggots which are bred in the backs of cattle.

WARPS. Flat wide beds of plowed land.

WATER-WORKERS. Makers of meadow-drains and wet ditches.

WELL. A chimney or vent-hole in a rick or mow.

WINTER-DAY. The winter season.

WINTER-WEED. *Veronica hederifolia*; ivy-leaved speedwell.

WISP. A rowel, or seton.

WOODBOUND. Land which is encumbered with tall woody hedgerows, so as to hinder a free admission of sun and air, and thereby prevent it from exerting its natural strength and fertility, is said to be woodbound.

WOOD-LAYER. Young plants of oak, or other timber, laid into hedges among "white-thorn-layer."

WRECK.

WRECK. Dead undigested roots and stems of grasses and weeds in plowland.

WRETWEED. (That is, wart-weed). *Euphorbia belioscopia*; sun-spurge.

WRONGS. Crooked arms, or large boughs, of trees, when the faggot-wood is cut off.

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UNCLE TOM'S CABIN. The name which covers a law of
 WARRIBLES. The large maggots which are bred
 WATER WORKS. Works of masonry built
 WALLACE. The winter of a house
 WART. That sort of bane of garden land.
 WRECK. Dead undigested roots and stems of grasses
 WRETWEED. (That is, wart-weed). *Euphorbia belioscopia*
 WRONGS. Crooked arms, or large boughs, of trees,
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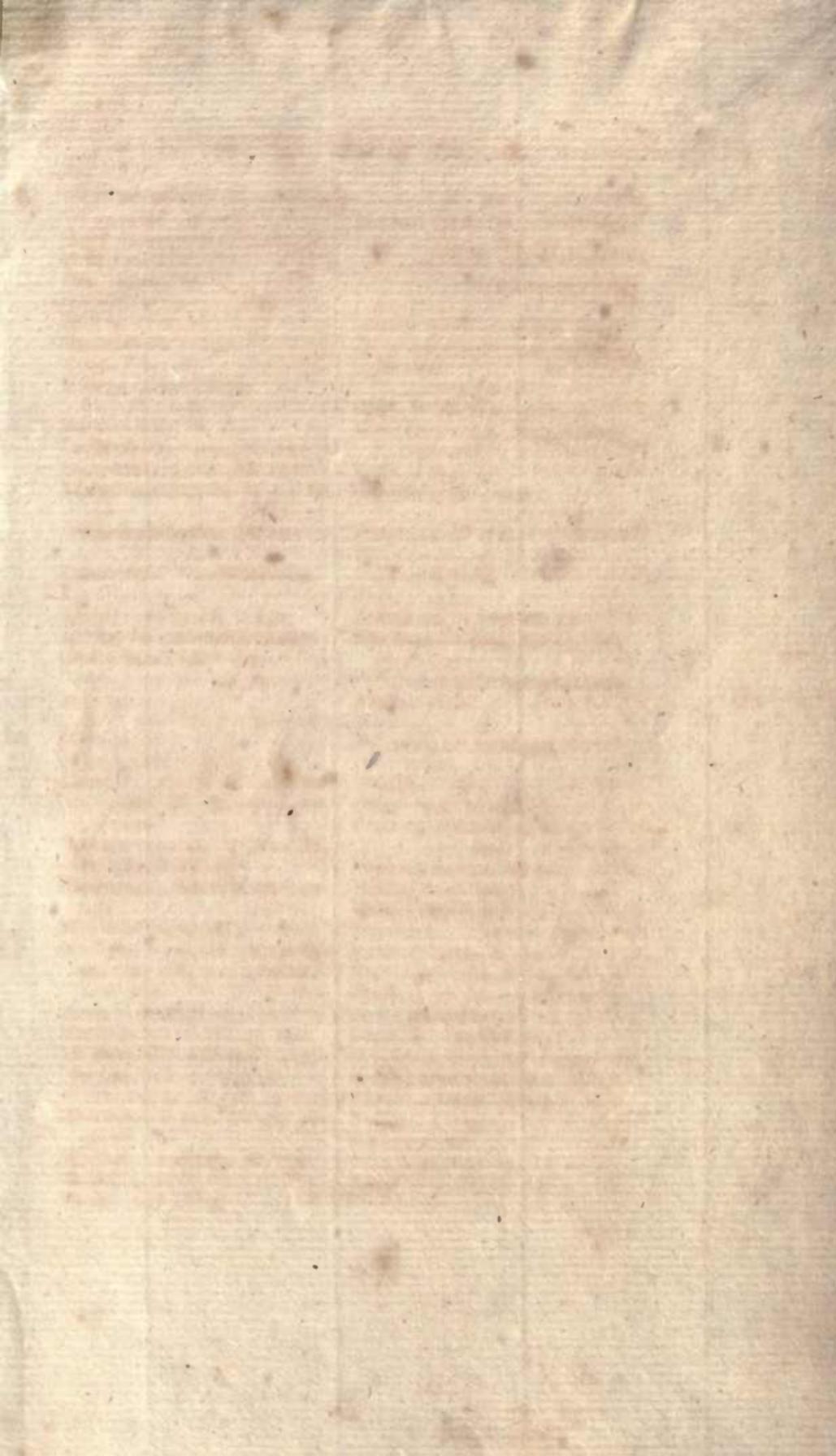
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