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~~THE~~
RURAL ECONOMY
OF Henry C. Taylor.
YORKSHIRE.

COMPRIZING THE
Management of Landed Estates,
AND THE
PRESENT PRACTICE of HUSBANDRY
IN THE
AGRICULTURAL DISTRICTS
OF THAT COUNTY.

By Mr. MARSHALL.

THE SECOND EDITION.

IN TWO VOLUMES.

VOL. I.

LONDON:

Printed for G. NICOL, Bookseller to His Majesty, Pall Mall;
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and J. DEBRETT, Piccadilly.

M,DCC,XCVI.

1796

ADVERTISEMENT.

FROM Norfolk *, I passed, in November 1782, through Lincolnshire, into YORKSHIRE : where I spent six months : principally, in observing and registering its Rural Practices : a task I was the better enabled to perform, in so short a time, as my early youth was spent among them ; and my acquaintance, with the present Practitioners, extensive.

When I left the County, in May 1783, I considered myself possessed of Materials sufficient for the purpose, which I had at that time in view. But, on digesting my papers (after I had seen the Practice of Norfolk through the Press), I found many additions wanting, to render my Register fit, as a separate Work, for the public eye. I therefore paid this Country a second agricultural visit, in March last, (1787 ;) and have made a

A 2

farther.

* See the Preface to the RURAL ECONOMY of NORFOLK.

farther stay in it of nine months: during which time, I have not only filled up the deficiencies, I was aware of; but have received a greater influx of fresh information, than I had any reason to expect.

It was my intention, when I came into the County, to have made EXCURSIONS, into its several Districts; but having found, in the immediate environs of the STATION, full employment for the time appropriated to the County, I am under the necessity of postponing the intended excursions. I postpone them, however, with less regret; as, in acquiring a general knowledge of the RURAL ECONOMY of the KINGDOM, the primary object is to obtain, with fullness and accuracy, the *widely differing Practices* of STATIONS, chosen in DISTANT DEPARTMENTS. The *partial excellencies* of INTERMEDIATE DISTRICTS, howsoever desirable they may be, are objects of a secondary nature.

PICKERING, 21 December 1787.

PUBLISHED, March 1788.

ADVER-

ADVERTISEMENT

TO THE

SECOND EDITION.

THE Surveys that have recently been made, under the Direction of the BOARD OF AGRICULTURE, have precluded the necessity of extending my Examinations, in this County.

I have, however, purposely refrained from profiting by these Surveys, in this Edition; as it is my intention to go through the whole of the Board's Reports, analytically, and to select such Notices, and Particulars of Practice, as may have escaped my own Observations, in the several Departments of the Kingdom. Indeed, it has been my desire, in revising these Volumes, to *compress* them, rather than to *enlarge* their bulk, and to
confine

confine them, as closely as I could, to MY OWN OBSERVATIONS ON THE ESTABLISHED PRACTICES of this Department.

For, it may be proper to remark, that, at the time these Volumes were written, the Completion of my General Design was in a state of great Uncertainty. I was therefore the more anxious to instil into them the practical Ideas, which a length of experience had furnished, but which had not been previously registered: and the precarious state of my health, at that time, was another motive for my wishing to incorporate them with the Practice I was then registering; more especially, perhaps, as it was the Practice of my native Country. But on revision, I have found them, in general, so firmly engrafted on the provincial practice of the District, as not to be separable from it, without violence. Some general Observations on the Extirpation of Weeds, being the chief part of the adventitious matter I have been able to separate, with strict propriety.

However,

However, in prosecuting this deliberate Revival, I have been attentive to improve the general ARRANGEMENT of the Work, and have made such other CORRECTIONS and ALTERATIONS, as Time and increasing Experience have enabled me to make.

To each Volume, I have now prefixed an ANALYTIC TABLE OF CONTENTS; as well to give the Reader a comprehensive View of the general Subject, with its various Divisions and Ramifications, as to lighten, as much as possible, the Labor of Reference.

LONDON, *September*, 1796.

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WEST
MORE
LAND

D U R H A M

THE
WESTERN
MORELANDS

CLETON

CRAVEN
CASHIRE

DIS
TRICT

CHESH.
DERBY
SHIR

THE
RURAL ECONOMY
OF
YORKSHIRE.

THE COUNTY
DIVIDED INTO
NATURAL DISTRICTS.

YORKSHIRE has always been spoken of as the first Province of these kingdoms. If we consider its superior magnitude; the variety and strength of its natural features; the fertility of its soils; and the industry of its inhabitants; the abundance and copiousness of its rivers; the richness of the views on their banks; and the wildness of those which are found among its mountains;—it is well entitled to pre-eminence.

VOL. I.

B

Viewed

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Viewed as a field of RURAL ECONOMY, it is divisible into MOUNTAIN, UPLAND, and VALE. The VALE OF YORK, falling gently, from the banks of the Tees, down to the conflux of the Trent and Humber, is Nature's grand division of the County, into EAST and WEST YORKSHIRE.

WEST YORKSHIRE naturally subdivides into mountains, which I shall term the WESTERN MORELANDS; into CRAVEN, a fertile corner cut off from the county of Lancaster; and into a various MANUFACTURING DISTRICT: EAST YORKSHIRE into CLEVELAND; the EASTERN MORELANDS; the VALE OF PICKERING and its surrounding banks; the WOLDS; and HOLDERNESS.

The WESTERN MORELANDS are links of the extensive chain of mountains, which rise with the Staffordshire Morelands, and continue through Derbyshire, Yorkshire, Westmoreland, and Cumberland, with but few interruptions, to the Highlands of Scotland. These mountains are covered with heath: but the vallies, which intersect them, are cultivated. Wensleydale, the largest of these vallies, is fertile; and abounds with romantic scenery.

CRAVEN

CRAVEN is well cultivated, and rich in soil, but not uniformly so; its surface being broken: it is neither a valley, a vale, nor a plain; nor does it fall under the idea of a mountainous or an upland country. It is small, compared with the other Districts of West Yorkshire.

The MANUFACTURING DISTRICT is strongly featured. The northern and western parts of it mix with barren mountains. The more southern and eastern limb,—a lovely declivity shelving gently into the Vale of York—is rich and highly cultivated; excepting the most southern extremity, which partakes of the sandy hills of Nottinghamshire; and excepting the mountains on its western margin, which assimilate with those of Derbyshire.

The VALE OF YORK is various in fertility. The fens at its base, and a heathy plain, part of the ancient forest of Galtres, north-eastward of the city of York, are drawbacks from its productiveness. In a general view, however, it has not, in this country, its equal. The vales of Gloucester and Evesham are more fertile, but less extensive. The wide flat of country which lies between the hills of Surrey and Kent, and the Downs of Sussex,

may vie with it in extent, but not in general fertility. If we estimate the Vale of York by the number and copiousness of its rivers, and by the richness of its marginal banks, it would, perhaps, be difficult to equal it, in any country.

CLEVELAND is, in general appearance, a continuation and appendage of the Vale of York ; there being no other natural division between them, than what is given by an unperceived elevation of surface. The waters of the Vale of York fall into the Ouse and Humber ; those of Cleveland into the Tees ; which divides it from the county of Durham.

The EASTERN MORELANDS appear as a detached mass of mountain, broken off from the BRITISH ALPS which have been mentioned. The northwest limb of this fragment is an abrupt broken precipice :—at the top, a barren heath :—at the foot, the Vale of York, and the fertile plains of Cleveland. From the brink of this giant precipice, the Morelands dip gently southward to the Vale of Pickering ; on whose verge rise, abruptly, a range of thin-soiled limestone heights ; which, in a similar manner, shelve gently into the Vale ; forming its northern margin.

The

The VALE OF PICKERING is a singular passage of country. A lake left dry by nature. A bason, formed by eminences on every side, save one narrow outlet of the waters, collected with in its area, and upon the adjacent hills. Nature, perhaps, never went so near to form a lake, without finishing the design. A dam of inconsiderable length across the Derwent, near Malton, would deluge the entire Vale; and the first passage of the waters would, in all probability, be down the sea cliffs, which are its eastern extremity*.

B 3

The

* Nevertheless, this natural unity, which, as a District, is not to be equalled in the Island, for entireness, regularity, and distinctness of outline, has heretofore been *nameless*! The principal part of it lies within the Hundreds or Weapentakes, of PICKERING LITHE and RYDALL; both of which extend over and include large portions of the Eastern Morelands,—a mountainous barren Country,—while a small part of it (south of the Derwent) lies in the eastern Division of the County. In the Treatise on Planting, &c. published some years ago, I named it the Vale of Derwent; but to this there was an objection; as the Derwent and the Rye (a branch of the Derwent) are common to the District: beside, it has been the practice of our ancestors to name similar passages of country, from towns which belong to them; as the VALE OF AYLESBURY, the VALE OF EVESHAM, the VALE OF TAUNTON, &c. And waving the privileges of antiquity and
royalty,

The WOLDS of Yorkshire appear as if, during some convulsion of nature, they had been severed (by the sea-like Humber and its broad rich banks) from those of Lincolnshire. In the present state of things, they may be considered as the main link, broken off from the chain of chalky hills, which is thrown irregularly over the more southern provinces. The Yorkshire Wolds are the Downs of Surrey, on a large scale. They are the most magnificent assemblage of chalky hills the Island affords. The features are large; the surface is billowy, but not broken; the swells resembling Biscayan waves half pacified. The *ground* in general is peculiarly graceful: *Wood* and *water* would render it most beautiful. Water is forbidden: but wood may be had at will: and it is extraordinary that the spirit of planting should have broken out so late. Utility, as well as ornament, calls loudly for this obvious improvement.

HOLDERNESS, towards the Humber, is a low flat tract: the Marshes of Lincolnshire
on

royalty, which attach themselves to PICKERING; it claims, by its central situation, and the extensiveness of its own parochial rights to the lands of the Vale, the distinction I have here assigned it. (1796.)

on a reduced scale. But the more central parts are diversified in surface, and the upper margin, which forms the skirts of the Wold hills, is a lovely line of country. On one hand a fertile vale, abounding with wood and water : on the other, dry airy downs, rising, with an easy ascent, to the highest Wold.

THE COUNTY CONSIDERED, AS A SUBJECT OF RURAL SURVEY.

IN RIVERS, the County under survey is singularly well supplied. The HUMBER, which might well be styled the RIVER OF RIVERS, bounds it on the south. The TEES forms its northern confine. The DON, the AIR, the WHARF, the OUSE, and the DERWENT rise in its mountains, and wind through its plains. In a COMMERCIAL light, these rivers are objects of the first magnitude. The tide flows into the center of the county. Not only *Hull*, but *York*, *Tadcaster*, *Ferrybridge* and *Doncaster*, may be called INLAND PORTS. The Don is rendered navigable, to *Rotherham*, *Sheffield* ; the Air, to *Leeds*, *Bradford* ; the Calder, to *Wakefield* and to near *Halifax* ; the Ouse, to *Burroughbridge* ; the Derwent, to *Malton* ; the Hull, to *Driffeld*,

at the foot of the Wolds ; and the Tees, to *Tarm*, on the borders of Cleveland, at the head of the Vale of York.

If, with the natural advantages this county possesses in its rivers, we view those which are given it by its MINES of coals, allum, iron, lead, copper ; and its MANUFACTURES of woolens and iron wares ; commerce appears to be singularly indebted to it : while to the SEA PORTS of WHITBY and SCARBOROUGH—as nurseries of hardy seamen—the nation at large owe much.

But national policy and commerce make no part of the present design ; unless when they are intimately connected with RURAL ECONOMICS. It therefore remains to view the county, as a SUBJECT OF RURAL ECONOMY.

No country entirely mountainous, nor one which is disturbed by manufacture, can be a fit subject of study, for rural knowledge. The WESTERN DIVISION of the County falls, chiefly, under one or other of these descriptions. There are no doubt lands, in West Yorkshire, which are highly cultivated ; especially about Doncaster, toward Ferrybridge ; a passage worth perusing.

NATURAL AND ACQUIRED ADVANTAGES
OF EAST YORKSHIRE.

BUT if we attend to the EASTERN DIVISION, we shall find collected, within comprehensive limits, almost every description of country which is interesting in rural affairs. A rich, well cultivated plain; a group of almost barren mountains, inviting objects of improvement; a fertile vale, various in soil and cultivation; with a tract of chalky downs, terminating in a rich marshland country: including grass land of every class, and arable land of almost every description. It is the Island in miniature.

Nor do these NATURAL ADVANTAGES, alone, render East Yorkshire a desirable object of study: the INDUSTRY OF ITS INHABITANTS makes them peculiarly attentive to MINUTIAL matters; while the SPIRIT OF IMPROVEMENT, which has lately diffused itself, among all ranks of men, renders this District singularly eligible, as a field on which to trace the greater OUTLINES OF MANAGEMENT,

THE

THE VALE OF PICKERING.

INTRODUCTORY VIEW

O F THIS DISTRICT.

I. **SITUATION.** The situation of this division of East Yorkshire has been already given. Its **OUTLINE** is somewhat oval.

II. The **EXTENT** of its larger diameter about thirtyfive miles ; its greatest width about twelve miles : including, in its area, and the cultivated lands which hang upon its banks, and which as property belongs to it, about three hundred square miles, or 200,000 acres.

III. **SURFACE** and **SOILS.** The **AREA** of the Vale is extremely flat ; nearly level ; but being broken by hillocks, of different magnitudes, irregularly scattered,—and some-
times

The VALE of PICKERING

times by promontories shooting from the marginal banks,—the eye can seldom judge either of its flatness or its extent.

These HILLOCKS and HEADLANDS are invariably fertile; mostly a fat clay: while the base on which they stand is either a rich sandy loam; the common soil of the west end of the Vale; or an inferior clay, interspersed with patches of moory soil: the prevailing soils of the marshes, and carrs, of the Eastern division.

The MARGINS are variously soiled. The skirts of the banks are mostly a rich middle loam; dry, yet *cool* (how eligible for the sites of villages!) but generally decrease in quality, with the rise of the hills which back them*.

The face of the WOLD HILLS (which on this side are bold but not broken) terminates, at the summit, in a thin chalky loam; —the soil of Epsom and Banstead Downs.

The range of hills which rise at Malton, and fill up the space between the Wolds and the Heights of Hambledon; which at present are without a name; but which I shall term
the

* For the SUBSTRATA of the Vale, see the Section SOILS, and their MANAGEMENT.

the HOWARDIAN HILLS* ; are lower and less abrupt; terminating in a various soil; covering a well grounded, well wooded, fine sporting country; — the inferior hills of Kent.

The NORTHERN MARGIN rises, in general, still less abruptly; terminating in a thin limestone loam, lying on a chain of heights, broken by wooded vallies, and backed by the moreland hills; which are intersected by cultivated “dales,” appendages of the “country” out of which they issue.

IV. The CLIMATE of the Vale is *above* the latitude it lies in (54°). The summer seasons are three weeks, at least, behind those of the southern provinces. What is remarkable, the seasons on the southern banks, about Malton, lying of course with a north aspect, are forwarder, by more than a week, than those of the northern margin, which lie full to the sun. The substratum of both is the same; namely, Limestone Rock. The fact, perhaps, may be accounted for, by the pile of mountains which rise behind the northern banks; and which, though they discharge rivers of water, still retain at their
bases

* CASTLE HOWARD, the magnificent residence of HOWARD, EARL OF CARLISLE, is seated among these hillocks.

bases a sufficient quantity, to keep their skirts cool through the summer season.

V. The RIVERS of the Vale are the DERWENT and the RYE; which, by receiving the waters of the *Costa*, the *Seven*, the *Dove*, the *Riccal*, and other inferior brooks*, is more copious than the Derwent, at their conflux. The rivers have their rise in the moreland mountains, are collected in the dales, and wind through the wooded vallies, into the area of the Vale; through which they move, with sluggish pace, to their narrow outlet. As a proof of the flatness of the Vale, the waters of the Rye are some four or five days, in passing from Hemslay to Malton (about fourteen miles): and those of the Derwent, not less than a week, in moving from Ayton (about fifteen miles) to the same general outlet. It is highly probable, that, in a state of nature, a principal part of the Vale was subject to be overflowed. Even
now,

* A remarkable circumstance attends these brooks; all of which, from the Rye to the Costa (the Seven in a dry summer not excepted) sink (when at dead water) in the vallies between the Limestone Heights. Some of them rise again in the same vallies in which they sink: others disappear entirely. In the time of floods they all occupy the channels, which nature has provided for them, on the surface; and which, in the annexed Sketch, are marked by dotted lines.

now, since rivers have been cut, and embankments made, extensive fields of water are still to be seen, in times of floods ; not, however, through natural necessity, but for want of further exertions of art. By increasing embankments, and by removing obstructions natural and artificial *, the rivers, in their highest swell, might be kept within due bounds.

VI. INLAND NAVIGATION. The Derwent is made navigable to Malton ; and might, without extraordinary expence, be continued so to Ayton ; and the Rye and its branches might, with little exertion of art, be made navigable to Pickering, to near Kirkby, and to Hemfley. But a sequestered vale, without mines or manufactories †, and with two sea ports in its neighbourhood, and an inland port on its margin, requires the less assistance from internal water carriage. A removal of the present obstructions of the rivers is wanted, here, rather than more artificial ones. 1796.

* The cataract-like mill dam across the Derwent, at Old Malton, is a public nuisance which reflects disgrace on every man of property in the Vale. It appears as if intended to finish what nature has left undone !

† Excepting a manufactory of coarse linen, which prevails, more or less, I believe, through the several districts of East Yorkshire.

1796. Since the first edition of this Work was published, two schemes have been suggested, and surveys made, by opposing interests, for bringing sea coals into the Vale, by means of inland navigation ; the one from the port of Whitby, the other from that of Scarborough.

The latter is, by far, the most practicable. The base of the Vale is nearly level, from end to end, and the east end of it is not excessively elevated above the tide ; and its distance, from Scarborough, as appears on the map, is inconsiderable.

This short ascent being surmounted, the only difficulty would be passed. A canal, of seventy or eighty miles in circuit, might be run round the Vale, *without a lock!* and without injury to the courses of the natural rivers.

The direction of such a canal would be nearly that of the dotted line of the map annexed (though not traced for this purpose). It would of course supply four market towns, and upwards of fifty villages, with water carriage : not only of fuel, manures, farm produce, and timber ; but of passengers,—on the Duke of Bridgwater's plan of stage boats : the cheapest and most easy mode of travelling.

From

From the west end of the Vale, a communication would not be difficult to make, with the canal, lately undertaken in the Vale of York; and thus open an inland communication, by water, between Scarborough, York, Hull, and the manufacturing district of West Yorkshire.

Should this Island continue to prosper, half a century longer, there can be little doubt of an improvement, so selfevidently great, being carried into effect.

VII. TOWNSHIPS. The feet of the marginal swells are studded with TOWNS and VILLAGES; which, in some parts, are not a mile asunder; but, in others, are farther distant, and less regular.

To these marginal TOWNSHIPS belong, generally, the lands of the Slope, with a portion of the area or bottom of the Vale; which, through this reason, is thinly inhabited. From the center, westward, a few villages are scattered; but from thence, eastward, the entire area, one township excepted, is included within the townships of the margin.

VIII. STATE OF INCLOSURE. A century ago, the marginal townships lay, perhaps, entirely open; and there are vestiges

tiges of common fields in the area of the Vale. The west marshes, church property, have been longer under inclosure: and the central townships were probably inclosed, long before those of the margin; the soils of that part being adapted to grass; and while the surrounding country lay open, grass land was of singular value. At present, the entire Vale may be said to be in a state of INCLOSURE; a subject which will be spoken of, fully, in its proper place.

IX. PRODUCE: wood, grass, and corn: the two latter at present intermixt, from the center of the area to the summit of the marginal heights.

X. The wood, though abundant, being confined principally to the vallies of the margins, does not afford general ORNAMENT; nor even appear to the eye at a distance. On a near view, however, some of those vallies contain great beauties. The situation of Rivaulx, the site of a dilapidated monastery, would satisfy the most craving eye. Were the extensive woodlands, which these vallies contain, scattered on the bosoms of the surrounding hills, the Vale of Pickering would be a passage of country, as singular in point of beauty, as it is in natural situation.

THE
RURAL ECONOMY
OF
THIS DISTRICT.

DIVISION THE FIRST.
LANDED ESTATES,
AND THEIR
MANAGEMENT.

I.

ESTATES AND TENURES.

I. THE LANDS of the Vale are much in the hands of small owners. The only large estate, which it contains, lies on its Western margin; and this, for magnitude and intireness, is exceeded by few estates in the kingdom. The towns of Hemsfley and Kirbymoorside, with the villages in their neigh-

neighbourhoods, and an immense tract of Moreland, reaching to the verge of Cleveland, are included in the DUNCOMBE estate. The EARL OF SALISBURY has a considerable property scattered across the richer part of the Vale, from Sinnington to Brawby: and there are some few other off estates of Noblemen, in different parts of the District.

II. The CROWN still retains, in right of the Dutchy of Lancaster, some property in the antient forest of Pickering; and the ARCHBISHOP OF YORK has a considerable estate in the marshes.

SIR WILLIAM ST. QUINTIN has a good property, about his residence at Scampston, and some other Gentlemen have residences and property in the Vale.

But the major part of the lands of the District are the property, and, in general, are in the occupation, of YEOMANRY; a circumstance this, which it would be difficult to equal in so large a District. The township of *Pickering* is a singular instance. It contains about three hundred freeholders, principally occupying their own small estates; many of which have fallen down, by lineal descent, from the original purchasers. No great man, nor scarcely a Country Gentleman,

has yet been able to get a footing in the parish; or, if any one has, the custom of portioning younger sons and daughters, by a division of lands, has reduced to its original atoms the estate which may have been accumulated. At present, no man is owner of three hundred pounds, a year, landed estate, lying within the township; although its rental, were it rack-rented, would not be less than six or seven thousand pounds.

III. The prevailing TENURE is FREEHOLD; which, however, is in many cases subjected to a small *free-rent*, reserved by the Crown, or the feudal lords of which it has been originally purchased. In Pickering, which is still held by the Crown as part of the Duchy of Lancaster, the free-rent of the township is 28l. 13s. which is received annually, by the freeholders in rotation, and paid, in part, into the hands of the lessees of the Crown; the remainder, I understand, to the heirs of the late Lord Feversham*.

The COPYHOLD tenure is less prevalent, here, than in some other Districts: nevertheless,

* Part of the township, it is said, having been given up in discharge of monies advanced the Crown by a citizen of London; who, in parcelling it out, has reserved a free-rent of 8l. 2s. 6d.

theless, it occurs in different parts of the Vale.

The West marshes are principally under BISHOPS LEASE for three lives.

An antient PRIVILEGE, founded in conveniency or a degree of necessity, and established in right by long custom, still remains evident in this District. This privilege, which is here termed a *windrake*, and which, probably, heretofore was granted, and may still be traceable, in different parts of the kingdom, gives the occupiers of one parish liberty to drive their cattle, to water, over the commons of another, which happen to lie between a messuage, hamlet, or village, and a brook or other convenient watering place; with, however, a provision, that the cattle so watered shall not be suffered to “couch and layer” on the ground driven over. But this original stipulation having in some cases been neglected to be complied with, the *windrake* has, in time, grown into a right of commonage. An instance, wherein such a right has been established, will be mentioned under the article INCLOSURES,

2.

GENERAL MANAGEMENT OF ESTATES.

PREFATORY REMARKS.

THE LEADING PRINCIPLES of management, here, differ widely from those which prevail in Norfolk *. Here, tenants are in full possession of the farms they occupy ; which, until of late years, they have been led, by indulgent treatment, to consider as hereditary possessions ; descending from father to son, through successive generations ; the insertion of their names in the rent-roll having been considered as a tenure, almost as permanent and safe, as that given by a more formal admission in a copyhold court.

One of the first estates in the District afforded, some years ago, a striking instance of
this

* See THE RURAL ECONOMY of NORFOLK.

this indulgent treatment. In the early days of its late possessor, the tenants were not only suffered to *bequeath* their farms, to their respective relations, but to *sell* the "good-will" of them, to strangers.

The effects of this, perhaps, unprecedented indulgence were these: the happiness of thousands of individuals;—a respectability of character of the source of so much benevolence; a retardation of improvements in husbandry; and, consequently, a loss of produce to the *present* community; this being one of the few instances I have met with, in which a lowness of rent has operated as a cause of indolence in the renter.

In the later part of life, this beneyolent character, perceiving perhaps the evil effect of too great indulgence, or actuated by other motives, increased his rent roll some 50 *per cent.* But still he preserved his respectability: for his farms were still moderately rented.

The present possessor has repeated the advance; but whether with equal propriety and equal credit, is a matter not necessary to be discussed in this place.

A similar conduct has been pursued, on another considerable estate in the Vale, and with similar effects. The first rise was mo-

derate, and made with judgment ; the last ill judged and immoderate ; intailing years of wretchedness on numbers, who had hitherto partaken of the common comforts of life *.

These, and other instances which have fallen within my knowledge, are sufficient evidences of the folly of deranging an estate, by excessive rents. Heretofore, the tenants on the estates above noticed, not only *kept up* existing erections, in proper repair, but *renewed* with substantial buildings ; and made other improvements upon their respective farms, with the spirit of owners ; considering them, in every respect, as their own estates ; under a confidence that no advantage would be taken of such improvements ; but that they would remain with themselves, and descend to their families.—Now, necessary repairs are neglected, buildings suffered to diminish, and improvements in husbandry laid aside ;
FOR ALL CONFIDENCE IS LOST :
 one rise has not been thought sufficient, and two may be thought too few. It is said,
 and

* 1796. Fortunately for these tenants, though unfortunately for their Country, the rapid increase of paper money, and the consequent increase of the prices of farm produce, has saved them from that extreme of poverty, which threatened them, at the time the above passage was written.

and I am afraid with truth, that the common good management of laying down lands with grafs seeds has been dispensed with, “for fear
“the field should look green, and the rent
“of the farm be raised”!

Let this be as it may, it is abundantly evident, that both extremes, in the rate of rent, are prejudicial to an estate; and that in fixing a rental, as in all other human affairs, there is a **HAPPY MEDIUM**, which, though often difficult to find, always deserves to be sedulously sought. No attention ought to be spared, in endeavouring to ascertain the **FAIR MEDIUM VALUE** of an estate to be raised; for on this, only, the advance can be adjusted with propriety.

It is evidently a want of policy, in the manager of an estate, to do any act which forfeits the confidence of **TENANTS AT WILL**. For, in this case, confidence is the only tie between landlord and tenant; and if a rise of rent be necessary, it should be made with judgment and moderation, and at one advance; that the necessary confidence may not be shaken, and the estate thereby rendered liable—to the waste of tenants at will, driven to despair.

With

With a LESSEE, the case is different: the lease is, in this case, the tie: the maintenance of buildings, the usage of lands, and the term of occupation, are fixt; and the responsibility of the tenant may, in this case, apologize for an excessive rent, though it will not always be found a guard against its evil effects. However, it may be fairly inferred, that an estate can, with propriety, be rented higher under lease, than at will: and further, that LEASES, OR A FIRM RELIANCE IN THE TENANTS, ON THE HEAD AND HEART OF THEIR LANDLORD, ARE, ON EVERY ESTATE, ABSOLUTELY NECESSARY TO IMPROVEMENTS IN HUSBANDRY.

It is not my intention to draw general inferences, unless they result aptly from facts under observation; and unless they tend to what appears to be an obvious improvement, in the general management of the District under survey. Nor is it my intention to *dictate*, or even to *recommend*, unless when such improvements present themselves to my mind, in strong colours.

It appears, evidently, that, on the larger estates of this District, the tenants (entirely at will) have lost much of the confidence, which ought to subsist between landlord and tenant;
and

and it strikes me, clearly, that it would be good management, on such estates, to grant leases, on the larger farms, and fix the smaller ones at such rents, and under such assurances, as will restore spirit and peace of mind to their occupiers.

The management of a landed estate is not a light matter; the prosperity and happiness of the country it lies in, are nearly connected with it. And no other apology, I flatter myself, will be required for publishing the foregoing facts and reflections; or for venturing to recommend an innovation, which prudent management might have rendered unnecessary.

The particular departments of management which require to be spoken to, under this head, are,

1. Manor Courts.	6. Covenants.
2. The Purchase of Lands.	7. Removals.
3. Tenancy.	8. Receiving.
4. Length of Term.	9. Heads of Lease.
5. Rent.	

I. MANOR COURTS. These antient sources of the law of villagers are still pretty generally kept open; even in manors where neither copyhold nor free-rent tenants remain; and where, of course, their legality is
dis-

disputable. Nevertheless, they have still their uses: the cleansing of rivulets and common sewers,—the repair of roads to grounds,—the sufficiency of ring fences,—and the estimation of damages by impounded cattle,—the stocking of commons, and the removal of public nuisances,—are matters which frequently require the interposition of a jury; who, in places where they are still impanelled, are considered, not only as judges of the general welfare of the manor, but are frequently called in, as arbiters of private differences: and who are so fit to settle village disputes, as a jury of neighbours, who have personal knowledge of the parties, and the subject matter in dispute?

In a manor, where the lord has no interest in the well ordering of the lands and the inhabitants it contains, it might seem unreasonable to oblige him to maintain a court, at his own expence; but if fines for non-appearance, and amerciaments for defaults, could be legally recovered, the extra charge, if any, would be small, and might be borne by the county. And there appears to be no solid objection to a regulation, which would in the end be productive of public as well as private good: for whatever tends to the
ad-

advancement of cultivation and the well ordering of society, contributes to the virtue and prosperity of a Nation.

II. PURCHASE OF LANDS. From the multiplicity of small estates, in this District, frequent transfers of property take place; a market for land is always open, and the fair market price pretty accurately understood; consequently, the FLUCTUATING VALUE OF LAND may here be observed, with advantage.

Some years ago, the price was extremely high; forty or fifty years purchase, upon a very high rent: lands not worth fifteen shillings an acre *rent* were sold for forty pounds *purchase*. This, however, was not uniform, through the District: for, at the time those extravagant prices were given, in one part of the Vale, lands, of twice the rental value to a farmer, were sold, in other parts of it, at exactly the same rate; though the distance between them is only a few miles; and in the same District, similar land is not, now, worth thirty pounds.

The cause of this disparity is a proper subject of investigation. The situation in one case is dry, with good roads; in the other low, and the roads deep and miry. *That*
is

is chiefly in the hands of small owners—most of them monied men, and anxious to increase their *possessions*: *this* principally in the occupation of tenants. In *that* the rage of possession had broken loose, and ideal values had in consequence been fixed to the lands on sale; while the lands of *this* were *out of fashion*, and of course neglected. A moveable commodity may be carried to the best market; but land can only be sold at what is esteemed the fair market price, in the place it happens to lie in.

Hence it seems to follow, that a person who wishes to purchase, at a cheap market, without regard to locality, should look for a neglected District, and endeavour to avoid the neighbourhood of small owners, and that inordinate lust of possession, which is evidently epidemical, but not continual.

On the contrary, one who wants to sell should wait, if he can, until a *dear time* offer itself; or otherwise accept, perhaps to a disadvantage, the *fashionable price* of the day.

These inferences, however, are more strictly applicable to small than to large purchases.

The

The present medial price of land, in this District, is about thirty years purchase, upon a fair rental value; but varies much with the circumstances it happens to be under.

III. TENANCY. Upon most of the larger estates LEASES are unknown; the farms have been let AT WILL, and held as hereditary possessions, through successive generations. But it has been already observed, that the basis, on which this species of tenancy formerly rested, has of late years been sapped, and is no longer sufficiently secure, either for landlord or tenant.

In the marshes, in which the Archbishop of York has considerable property, LEASES FOR LIVES is the ordinary tenancy; and there, it is observable, rapid improvements in husbandry have been made. The farms are of a good size; and in the hands of men of property and spirit;—ranking, in every respect, with the superior class of yeomanry. See FARMS.

IV. LENGTH OF TERM. Lime being the factitious manure of the District; and upon old-inclosed land, the principal means of improvement; it may seem that a short term would be here sufficient. But if it be considered that the nature of much
of

of the land, and the established practice and produce of the country, require an alternacy of corn and pasture, *fourteen years* is a reasonable term: if the price of labor and produce could be foreknown, twentyone years would, for the tenant, the estate, and the community, be more eligible.

V. RENT. Extremely high. In most parts of the Vale, much higher than even in Norfolk. There are lands under the ordinary course of husbandry let, to farmers, at thirty to forty shillings an acre. In many parts of the kingdom the same lands would not let for two thirds of the price.

These circumstances imply a goodness of land, and a superiority of management,—or improvidence on the part of the renter. The three may be concerned. The land is good, and the management, in one particular, excellent; and it is allowed, that to this piece of management is principally owing the present high rate of rent.

Formerly, it was the universal practice to plow with four oxen and two horses, together with a plowman and one or two assistants. This extravagant plowteam is now universally reduced to two horses and a plowman. It is at least remarked, by men of observation

observation and judgment, that, without this saving in the mode of tillage, the present rents could not be borne.

It must be observed, however, that the lands, let at the above extravagant rents, lie in eligible situations, and are let in small parcels. The larger farms lie, in general, in less eligible situations; and there are few, if any, so high as twenty shillings an acre.

To speak of the medium rent of the District would be vague; the rate of rent is, or ought to be, proportioned to the quality of soils; and lands worth from a pound to a penny an acre may, probably, be found on the same farm.

This variation of soil enables the observant cultivator to make accurate distinctions, in the expence of management and produce; and, consequently, in the rental values of lands of different qualities: and this may account, in some measure, for the extraordinary estimation in which good land is held in the District.

This distinction is, in general, too little attended to, upon large estates; the number of acres being, generally, too much regarded, and the quality of the soil too little. Maps

are convenient instruments in the hands of managers of estates ; but unless they shew, with sufficient accuracy, the *quality* and *situation*, as well as the *quantity* of the land they represent, they become dangerous guides in fixing a rental : an accurate valuation is much more estimable than a handsome map. The art of surveying may be learnt in a school ; but the judgment requisite in the valuation of lands can only be obtained, by great experience in the field, and by some considerable share of knowledge of the particular kind of land to be valued.

VI. COVENANTS. Under the old tenancy, *repairs* were done, and new erections made, entirely by the tenants, landlord allowing timber ; and, on some extraordinary occasions, a sum certain towards the workmanship and the other materials.

Gates and *hedges* were entirely under the management of the tenant ; landlord allowing timber for the gates and dead fences, as well as for *implements*, used upon the farm ; also hedging stuff and brushwood, for *fuel*.

The management of the *land*, too, was left to the tenant, who plowed and cropt it, in the same manner as he would in all probability have done, had it been his own estate.

While

While the necessary confidence on the part of the tenants remained, these principles of management were abundantly sufficient. The tenants took care of the estate as their own; the landlord's only care being directed to the annual receipt of the rent. But finding the tenants alarmed, and some of them no doubt dissatisfied, with the recent additions of rent, it was thought prudent to introduce new regulations, respecting timber and the management of lands: Woodlands have been inclosed, and woodwards appointed. The plow has been restrained; and particular crops prohibited.

VII. REMOVALS. The TIME of the removal of tenants, here, is invariably Old Ladyday.

By the custom of *this* country, tenants at will are allowed to clear the premises, previous to the day of removal, of *hay, straw, and manure!* quitting the farm, on that day, and leaving it entirely naked of every thing, except the *wheat on the ground*; which, at harvest, he reaps *and carries off!* paying only for the "on-stand," or rent of the land which the wheat has occupied*.

D 2

For

* Barley sown before Ladyday, *on fallow*, is also the tenant's, paying the incoming tenant for the on-stand only.

Fortunately, however, for all parties concerned, removals have, until very lately, been little practised in the Vale : for a worse time, or a worse mode, could scarcely be devised. Old Ladyday is the middle of spring seed-time ;—stock are still in the house ;—the hay and straw partly eaten, and in part to eat ;—and, at that time of the year, the roads, having been soaked and cut up, during winter, and stiffened by the winds of March, are in their very worst state. These are disadvantages to the outgoing tenant. The inconveniencies of an incoming tenant entering upon a farm, destitute of manure, and materials to raise it from, need not be enumerated.

In CLEVELAND, the time of removal is much more judicious. The incoming tenant takes possession of the arable land at Candlemas,—of the pasture grounds at Ladyday, and of the mowing grounds at Mayday ;—when the outgoing tenant quits every thing but the wheat.

These regulations are admirably adapted to REMOVALS IN SPRING, and render them more eligible, in many respects, than MICHAELMAS REMOVALS ; even when tempered with the NORFOLK regulations *.

Old

* See NORF. ECON. ART. FORM OF LEASE.

Old Michaelmas throws wheat feedtime too backward, and the unthrashed corn incurs a long and frequently tedious connexion, between outgoing and incoming tenant: besides, the hay, the turneps, the feedage of leys broken up, and of young clover after harvest, make a long account between them: whereas, in Cleveland, the wheat on the ground, and perhaps a little remaining hay, are the only things to be valued (or removed), and the remaining wheat in the barn (if any) the only thing the outgoing tenant leaves behind him. If the barns be cleared by Mayday, which in general they may be without impropriety, the connexion between the outgoing and the incoming tenant (or landlord) dissolves, entirely, on the day of removal; which, namely *Old Mayday*, is an eligible season, and a leisure time of the year.

The chief inconveniency, attending this mode of removal, is that of the incoming tenant (residing, perhaps, at a distance) putting in the spring crops. But there is no day in the year, on which this disagreeable business can be done, without inconveniency to all parties; and all that can be done is, to find out such days, and fix upon such regu-

lations, as will reduce the inconveniency within the narrowest bounds possible.

From the observations I have hitherto made, New Michaelmas with the Norfolk regulations, and Old Mayday with those of Cleveland, appear to be the most eligible seasons of removal.

VIII. RECEIVING. The TIME of receiving varies on different estates. On one, Candlemas for the Michaelmas rents, and Midsummer for those of Ladyday, are the established times; and were they adhered to, better days, for the purpose, need not be chosen; though in strict propriety the first of March and the first of June might be still better*. But to suit the conveniencies or the caprice of the receiver, the ordinary times are seldom adhered to, the tenants being left in a state of uncertainty, as to the time of receipt; notices being sometimes given and countermanded, repeatedly: a state of embarrassment this, to the tenants, which implies unpardonable management. On a large estate, the days of audit should be as fixt and invariable, as the days of entrance and removal; and nothing but extraordinary circumstances can warrant a deviation.

Upon

* See NORF. ECON. MIN. 47.

Upon another estate, still more considerable than that above alluded to, the practice is to receive a few days after the rents become due ; namely, about Ladyday and Michaelmas. Worse seasons would be difficult to fix upon.

With respect to the MODE of receiving, it is here reduced to the lowest degree of simplicity. The tenants not only repair and fence, but pay the land-tax of their respective farms, which they rent at a sum certain, subject to no deduction ; consequently, there are no accounts to be settled, nor any voucher to be examined.

IX. FORMS OF LEASES. It has been observed, that the lease is a species of tenancy uncommon in this District : I know but of one estate on which it has been adopted ; an off estate in the family of a Scotch nobleman. This estate is, I believe, principally under leases of fourteen years.

The form is not altogether excellent ; but in some respects it is singular ; and in others judicious. It exhibits the outline of management of that particular estate, and gives some idea of the Rural Economy of the District. There are clauses in it which many *good* tenants would object to ; but there are others which are well adapted to

the preservation of the estate, without appearing to be oppressive or disgraceful to the tenant.

Leases are annually becoming more and more necessary ; and it is my intention to adduce the forms of those of different Districts. The formation of a lease requires great circumspection. A collection of digested clauses will facilitate the task of drawing a new form, or improving an old one ; and will at the same time produce, with the most substantial materials, a *compendium* of the general Management of Estates, in different parts of the kingdom.

LANDLORD AGREES to let ;—certain specified premises ;—from Ladyday ;—for a rent agreed upon ;—during fourteen years, “ and thence from year to year so long as (both parties) shall please.”

ALSO, to put the buildings in tenantable repair.

LANDLORD RESERVES all mines, quarries, and royalties ; timbers, and timber-like trees, spires and other trees ;—with power to search for, cut down, and carry away, at seasonable times ; together with full power of sporting, &c. &c. (Tenant being allowed such damages

as two indifferent persons “ of equal degree” shall determine.)

ALSO a power to enter upon the premises, from time to time, to view the repairs, and the condition thereof.

TENANT AGREES to take ;—and to pay, without deduction (except the land tax) half-yearly ; namely, at Michaelmas, and Lady-day (or within twenty days, demand being duly made), under forfeiture of the lease.

ALSO, to pay such assessments, and to perform such services, duties, and customs, as are or shall be incumbent on the premises.

ALSO, to perform the customary leadings, or boondays, observed at the lord’s principal mansion ; ALSO “ all other suits, services, “ duties, and customs of any kind, which “ now are or shall at any time, during this “ demise, be taxed, charged, or imposed !”

ALSO, to observe all rules, orders, and bylaws of the courts leet and baron of the lord.

ALSO, not to let, nor suffer any person whomsoever to occupy, the whole or any part of the premises, “ other than him “ the said (tenant) his executors or administrators, their or his wife or children ;—or “ a cow-gait to a cottager, holding under “ the

“ the lord ; ” — without special licence in writing.

Also, to keep the buildings, fences, and watercourses in good repair ; and to scour, yearly, such ditches and watercourses as landlord shall direct : provided the part so set out do not exceed one sixth of the whole.

Also, not to cut down, shred, top, or lop timber or other trees ; but to defend, from cattle, all trees and hedges.

Also, not to burn fern, nor furze, for ashes for sale, without consent.

Also, not to sow rape, hemp, flax, woad, weld, madder, or hops ; nor more than a specified quantity of potatoes, without leave.

Also, to hoe, properly, all lands sown with turnep seed, and “ to dress and weed “ them according to good husbandry,” — under the penalty of 10s. an acre.

Also, to spend on the premises all the grass, hay, and straw grown thereon.

Also, not to sell nor carry off dung, or other manure.

Also, not to stock the premises with rabbits.

Also, not to suffer pigs to go loose without being rung. But in all things to use the premises in a husband-like manner.

Also,

ALSO, to resort with his corn, grain, and grist to his lord's mill.

ALSO, to employ such mole-catchers, and vermin-killers, as landlord shall appoint or approve.

ALSO, not to obstruct workmen, nor game-keepers, &c. &c.

ALSO, not to sport, nor keep sporting dogs, &c. &c. without leave in writing.

ALSO, *in the last year*, not to sow more than one fourth of the arable land with wheat.

ALSO, *in the last year*, to suffer the oncoming tenant to enter, after Michaelmas, to scale and dress the grass lands,—and to plow the arable for fallow, or for crops,—and to sow and harrow,—without hindrance.

ALSO, *at the determination* of the demise, “whether by surrender, forfeiture, or otherwise,” to leave the last year's manure, straw, dung, and compost.

ALSO, *to leave* in tenantable repair, and without waste or spoil, all the houses, buildings, fences, ditches, and banks; AND to discharge all taxes, and other outgoings due from the premises.

TENANT BINDS HIMSELF, &c. in a specified

cified sum for the due performance of the several covenants.

TENANT TO BE ALLOWED (*by award of arbitrators*) for the wheat of the last year:—to be valued in August or September, before it be cut:—deducting, from the estimate value, the rent of the land it may grow on, agreeably to a specified valuation.

ALSO, for the turnep fallow of the last year.

ALSO, for the hay and straw left unconsumed. AND for the manure of the last year; TOGETHER WITH the use of such land as landlord shall appoint, for the consumption of hay and straw, *after the expiration of the term*, until Mayday.

ALSO, *during the term*, to be allowed limestone for the use of the farm; such limestone being raised by the landlord, tenant paying fourpence, a waggon load, for raising them.

MUTUALLY AGREE that all unprovided-for disputes shall be settled by arbitration.

INCLOSURES.

3.

I N C L O S U R E S.

THERE has, no doubt, been a time (and not perhaps many centuries past) when the entire country lay open ; when common fields, common meadows, common pastures, open woods, and extensive forests and wastes, were the only division of lands, in this kingdom. Even the demesne lands of the feudal lords appear to have, once, lain open with the lands of their tenants.

FITZHERBERT, who wrote about two hundred and fifty years ago *, speaking of the
herbage

* ANTHONY FITZHERBERT was Judge of the Court of Common Pleas, in the reign of Henry VIII. Beside his *Natura Brevium*, Justice of Peace, and other works in the law, he left two on Rural Economy—the *BOKE OF HUSBANDRY* and the *BOKE OF SURVEYING* ;—the first treatises, probably, which were written on the subject, in the English language ; and the best that were written, for more than a century afterward. There has been some doubt about whether these two treatises were really written by Judge Fitzherbert ; but I flatter myself I shall, in its proper place, be able to adduce sufficient evidence of their being his productions.

herbage of townships, says, “ by that is to be
“ understodd the common pasture of the
“ town whereupon the herdman keepeth the
“ tenant’s cattle ; for it may be so good that
“ the tenants need not to have any severall
“ pasture” [importing in this place stinted
pasture] ; “ but that their common pasture
“ should be able to find all their cattle, both
“ horses, mares, beasts, and sheep : and so
“ it was of old time, that all the lands, mea-
“ dows, and pastures lay open and unclosed:
“ And then was their tenements much better
“ and cheaper than they be now ; for the
“ most part of the lords have enclosed their
“ demesne lands and meadows, and keep
“ them in severalty ; so that their tenants
“ have no common with them therein.” In
this state the cultivated lands of the kingdom
appear to have lain, in Fitzherbert’s day.
For in his last chapter, the subject of which
is, “ How to make a township that is worth
“ twenty marks a-year worth twenty pounds
“ a-year,” he recommends inclosure ; — not
as a known improvement to be persevered in,
but as a scheme eligible to be adopted.

In the present century, more especially
within the last fifty years, inclosure has made
a rapid progress ; and its effects have in
general,

general, I believe, been equal to those foreseen by Fitzherbert. The garden is the highest state of cultivation; open fields and common pastures the lowest; separate inclosures a middle state, which seems to be well adapted to the present population of this country.

Let this be as it may, the spirit of inclosure continues to be such, that, in half a century more, an open field, or an undivided common may be rare, and the remembrance of them will of course soon wear away. This is therefore the proper time to register interesting facts, relative to the subject, and *this* District the proper place for adducing them.

In my own remembrance, more than half the Vale under observation lay open: now, scarcely an open field, or an undivided common, remains. Besides, the largest parish in the Vale—one of the most extensive parishes in the kingdom—is now under inclosure; and the circumstances attending it are such, as have seldom occurred: a suitable opportunity, this, for endeavouring to ascertain just ideas of a subject, which, though it has of late years been much agitated, appears to be, even yet, imperfectly understood.

In the beginning of the present century,
the

the immediate township of PICKERING remained in its ancient uninclosed state.

Having been thought too large to be laid out conveniently as one township, it had been judiciously split into two divisions, by a natural line, a considerable brook, which runs through it.

On each side of the brook lay a suite of COMMON FIELDS; three in number; for the unvarying round of wheat, &c. beans, &c. fallow. These common fields were respectively divided into *oxgangs*, evenly scattered over every field; so that each occupier might have an equal or similar share of good and bad, near and distant land; the houses being in this, as in every other common-field township, placed in the *town*. Each field consisted of twentytwo *oxgangs*; each of which, on one side of the township, contained twenty four acres---on the other, twelve acres: consequently the six fields contained 2376 acres.

Each division had likewise its COMMON MEADOW.

Other portions of the township were laid out in STINTED PASTURES, wholly appendant to the common-field lands; each *oxgang* of which having a right to a limited number of gaits, for *cows* and *working oxen*.

The

The remainder of the township, containing many thousand acres, was COMMON.

During this century, the common fields and common meadows have been gradually contracting, by amicable *exchanges* and transfers, and are, now, in a manner wholly inclosed. The stinted pastures have, at different times, been inclosed “*by commission* ;” namely, by the unanimous reference of the parties concerned, to certain arbitrators or commissioners, appointed by themselves ; without calling in the aid of parliament. The commons are now under inclosure, pursuant to a *bill* procured for that purpose.

This bill, and the circumstances attending the procurement of it, afford a striking picture of modern inclosures by act of parliament.

The lands to be appropriated, in this case, consisted of 3,700 acres of culturable soil, valued (by the commission under the inclosure) at 3s. to 5os. an acre rent ; and of a still greater quantity of heathy barren land, reaching to the center of the morelands, valued (by the same) from below 3s. down to 3d. an acre. The quantity of oxgang or common-field land (as above ascertained) 2376 acres ; and the number of ancient com-

mon-right houses, or sites of such houses, two hundred and sixty.

To those 2376 acres *, and these 260 houses or sites, the commons belonged ; but in what proportion had not, for ages perhaps, been clearly understood. Within memory, it seems, an attempt was made to stint them ; but the regulation lasted only one year. Before and since that time, they have been, in the strictest sense of the word, *unstinted commons*, for all kinds of commonable stock ; excepting SHEEP and WORKING OXEN ; which last were, *by the by-laws of the township*, confined to the stinted pastures, and the upland commons ; and the former, to the upland commons only.

It may be taken for granted, that the first mover to an inclosure is private interest, rather than public spirit. In the case of Pickering, the LAND OWNERS, in general, were satisfied with the open state of the commons. Some of them who had inherited, ---or purchased at an advanced price,---lands which lay conveniently to the commons, were, of course, adverse to an inclosure ; and the mere HOUSE OWNERS were either apprehensive of the smallness of their claim, or
their

* Together with the meadow lands.

their voices were too weak to be heard, among those of the land owners.

Under these circumstances, the commons lay open, and would probably have continued in that state, had there been no other interest in the township, than that of the owners of its LANDS and HOUSES.

But the *tithe*, of three or four thousand acres of corn land, was an object of too great magnitude to be overlooked, by the lessee (for lives under the Dean of York); and, being seen, had charms in it too fascinating to be lost sight of.

Actuated thus powerfully, the *lessee of the tithes* applied to the LAND OWNERS, to join him in an application to parliament, for an inclosure. The land owners refused. Their conduct, however, was impolitic and ill judged; and a fair opportunity lost is not easily regained.

The lessee of the tithes acted under a restless impulse; and no matter the instruments he made use of, so they answered his purpose. He, therefore, applied to the HOUSE OWNERS; who, seeing riches within their reach, which till then they had never thought of, grew frantic with expectation.

A law agent, well suited to the design,

was pitched upon ; and other agents, no less qualified, gave him their best assistance. An equal division of the commons, among the houses only, was the prize held out ; and a bill, framed for the purpose of obtaining it, was sent up to Parliament.

A faint ill conducted opposition was made, by the land owners ; but a more powerful interest, well applied, having got there before them, their intentions of throwing out the bill were frustrated.

Parliament, however, seeing probably the iniquity of the bill, without being willing to enter into a minute investigation, or able, at their distance, to ascertain with conveniency sufficient facts, left a principal matter open to a trial at law ; namely, whether the commons should be divided among the houses, only ; or whether one moiety of them should remain with “ the lands of the township, which, “ upon the first of January 1784, belonged “ to the owners of antient common-right “ messuages, cottages or sites.”

In consequence of this order of Parliament, the question was tried, on a feigned issue, at the assize for the county, in the summer of 1785.

The

The trial was conducted with the same exertions, on the part of the promoters of the bill, and with the same tameness and ill-judged confidence, on the part of its opposers, as had been evident in every stage of the business. These circumstances co-operating with the “uncertainty of the law,” a verdict was obtained, in favour of the houses.

Thus, by *management*,—without even the shadow of *right* being offered,—the owner of a mere cottage without a garden-place, or of a heap of stones which had long lain as ruins, and who could have no rightful advantage whatever from the commons in their open state, became entitled to an equal share, under the inclosure, with the largest landowner; who, perhaps, previous to the passing of this law, occupied rightfully, some hundred acres.

It is true, many poor families may gain a temporary relief by this *inequitable* transaction; and so far the bill may have operated beneficially. But it must be evident, to those who have a knowledge of the township, and who think impartially on the subject, that they might, with equal propriety, have been relieved out of the inclosed lands, or the per-

sonal property of the land owners; and it could not be the intention of Parliament, to be instrumental in transferring the property of one man to another, without a sufficient reason; we may therefore safely conclude, that Parliament, in this case, were either imposed upon, or judged erroneously; or that they are in want of some

GENERAL PRINCIPLES OF INCLOSURE.

I shall not presume to dictate to Parliament; but as I have bestowed an unusual share of attention on this important subject, and may not have another opportunity, so suitable as the present, of speaking my sentiments upon it, I will here throw together the ideas which have struck me, as a groundwork for further argument.

It will be proper, in the outset, to take a view of the ORIGIN OF COMMONS, and the first laying out of townships.

Fitzherbert, whose opinion in this case is valuable, speaking of customary tenants, in his 13th chapter of Surveying, says, “ Customary tenants are those that hold their lands of their lord, by copy of court-roll, after the custom of the manor. And there be many tenants within the same manor
“ that

“ that have no copies, and yet hold by like
“ custom and service, at the will of the lord :
“ and in mine opinion, it began soon after
“ the Conquest. When William Conqueror
“ had conquered the realm, he rewarded all
“ those that came with him, in his viage
“ royal, according to their degree. And to
“ honourable men he gave lordships, ma-
“ nors, lands, and tenements, with all the in-
“ habitants, men and women, dwelling in the
“ same, to do with them at their pleasure.”
And in his 40th chapter, in which he pro-
poses to improve by inclosure, he says, “ It
“ is undoubted, that to every township, that
“ standeth in tillage in the plain country,
“ there be arable lands to plow and sow, and
“ leys to tie or tedder horses and mares
“ upon, and common pasture to keep and
“ pasture cattle, beasts, and sheep upon ;
“ and also meadow ground to get hay upon.”
In another part of the same treatise, chap-
ter 4. “ Of foreign pastures that be com-
“ mon,” he says, “ This is a dark letter to
“ be understood without a better declara-
“ tion, for it may be understood three ways.
“ In many towns, where closes and pastures
“ lie in severalty, there is commonly a com-
“ mon close taken in, out of the commons

“ or fields, by the tenants of the town, for
 , “ their oxen or kine, or other cattle, in
 “ which close every man is stinted, and set
 “ to a certainty how many beasts he shall
 “ have in the same, and of what manner of
 “ beasts they shall be.—Another manner
 “ of common is most commonly in plain
 “ champion countries, where the cattle go
 “ daily before the herdman, and lyeth near
 “ adjoining to the common fields; and it
 “ may lie in two or three places or more.—
 “ The third manner of common is the lord’s
 “ outwoods, that lie common to his tenants,
 “ as common moors or heaths, the which
 “ were never arable land.”

The same, or a similar distribution of lands remain, in every uninclosed township, to this day. Each township is ONE COMMON FARM; laid out into three arable divisions, for *corn*; a flat of meadow land, for *hay*;—and one or more *pastures*, for stock.

It appears evident from observation, in different Districts of the Kingdom, that, in laying out a township which contains a diversity of soil, the driest and best lands have been laid out as arable fields; the wettest, if sufficiently sound, as mowing ground; and the remainder as pasture land, and as a source of fuel.

fuel. In some townships, part of the pasture ground has been set apart as a stinted pasture, for some particular species of cattle; and, in others, part of the commonfield land has been laid to grass, for the purpose of teddering horses upon, in the corn years, and feeding sheep upon, in the fallow year.

In townships of a more uniform soil, good land, fit for arable, has been set out as common pasture; for, in the days when townships were laid out, it would have been less possible to have cultivated and manured the common fields of a township, without a common pasture, than it would now be, when the uses of clover and vetches are known, to manage a farm entirely under the plow.

It is therefore evident, that common pastures and common fields are, in their original intention, and ever have been in their use, as inseparable as animal life and food:—it was necessary to keep working stock, to till the fields, and almost as necessary to have other live stock, to consume the straw, and to raise manure. And it may be safely drawn, as an inference, that the *herbage* of the common pastures of a given township belong, *in their original intention*, to the arable and meadow
lands

lands of that township : for, without them, the former must have lain in perpetual fallow, and the hay of the latter have been useless. Consequently, *by the original intention*, every *house* which occupied *a portion of the arable and meadow land* of the township, had a right to *a like portion* of the *herbage* of the common pastures ; and this without any regard to the time of its being erected ; namely, whether before or after the laying out of the township.

But with respect to *fuel*, and the *panage*, (when these were not reserved to the lord) the original intention was undoubtedly different ; for a certain plot of woodland (for instance) was set out, in proportion to the number of *houses* in the township, at the time of setting it out. This was a grant of the lord, *to the houses in being, at the time of the grant* ; which particular houses thereby obtained an exclusive right to the fuel and panage thus granted ; otherwise an unlimited and excessive increase of houses might have abridged the original habitations in their right, and have done away the original intention.

Since the improvements in navigation, and in the art of mining, have taken place, many common woodlands have, probably, been
cleared

cleared away ; for it is evident, from observation, confirmed by tradition, that many of the grassland commons, which now remain, and which, a few years since, were thickly scattered over the kingdom, were formerly covered wholly, or partially, with wood ; the original sources of fuel and panage : which *fuel and panage* belonged exclusively to the *original houses* : consequently, when the land which produced them was cleared, these *houses* had a plea for an exclusive right to the *herbage* which succeeded.

Thus the *ancient houses* having, by original right, a claim upon the *wood*, and, by implication, upon the *herbage* which succeeded it, they became objects of importance, compared with modern houses ; and it appears to have grown gradually into a custom, which in time became law, that no modern house, nor even the lands of the township which lay to them, should enjoy either the fuel *or* the herbage of the commons.

And thus the antient houses, by implication, gained in part, and, by usurpation, entirely, a privilege of *presenting* the lands of the township, with the *freedom* of the commons : which privilege has rendered them more valuable, than modern houses, of equal size ; and this dif-

difference in value is the real interest they have in the commons.

It is the most they ever had, or can of right have, while the commons remain open. For a mere house, without land, has neither plow to work, manure to raise, nor fodder to consume, and cannot, in the ordinary course of husbandry, make any use whatever of the *herbage* of a common.

And with respect to the privilege of presentation, it is equally vague, in the owner of an antient house, to lay claim to an equalized share of the lands of a common, because he has a power of enfranchising the lands of others, as it would be in a lay-presenter of a living, to lay claim to the benefice, because he has the advowson. Whatever the *advowson* is worth, so much interest the presenter of the herbage of a common, or the profits of a living, has in that common, or that living.

From these premises we may infer, that *now*, neither an antient house without lands, of a given township, belonging to it, nor a parcel of land without an antient house being held with it, is entitled to any share of the common herbage of that township. But,
when-

whenever this house regains land, or the land is again laid to an antient house, the right of commonage returns. The right, therefore, only lies *dormant*; and is not, in either case, *extinguished*.

The same of a site. While covered with ruins, it can have no right either to fuel or herbage; but whenever the house is rebuilt and inhabited, a right of fuel returns; and having had lands laid to it, a right of herbage. And whatever a site is worth over and above the value of the land it contains, so much interest it has in the common lands of the township it lies in.

The interest of *dormant lands* may be ascertained, in a similar way: whatever their value is depreciated by the alienation from the commons, so much *less* interest they have in a division of them. To shut them out of an Inclosure Bill is to take them by surprise, and thrust them out of the township; thereby strangling that right which before had only slept; and which might the next year, or the next day, have awakened in its fullest lustre.

• Beside these particular interests, there is one general interest to be considered; namely, the *situation* of lands, houses, and sites, with respect to the common to be inclosed;—for
houses,

houses, at least, which are situated contiguous to a common, had, in the first instance, have had, ever since, and must have, while the commons remain open, a greater benefit from its herbage, and have on that account been sold and purchased at a greater price, than houses situated at a distance; and, of course, have a right to a greater share of the lands to be inclosed.

The interests of *sites* vary in a similar manner.

But, with respect to *lands*, this species of interest is less evident. While common fields and common meadows lie open, they have little advantage or disadvantage from situation, with respect to the common pasture. But where the arable and meadow lands have been inclosed, and the pastures remain open, situation becomes of considerable importance. And where the appropriated lands have been long held in severalty, and have been sold and purchased under those circumstances, the lands which lie near to the common pastures seem to have gained, by the circumstance of inclosure, ratified by long usage, an extraordinary and *permanent* interest in the herbage; an interest which they can never lose, so long as the appropriated lands remain inclosed, and
the

the common pastures remain open. Hence, it is unwise in those, whose lands lie at a distance from the common pasture, to suffer a partial inclosure to take place; for by that means they are establishing, to their own disadvantage, a species of interest in common pastures, which before had no existence.

Before we proceed farther, it may be proper to consider the *limits of commonright*, on *unfinted* common pastures.

It is generally understood, and may, I believe, be considered as the common law of the realm, that each commonright house has a power to summer as much stock on the common, as the lands which lie to it will winter: or, to speak more practically, a right to stock in proportion to the value of the lands, respectively held with the commonright houses: for it so happens, that by improvements in husbandry, since the time of laying out townships,—more especially where the appropriated lands have been inclosed,—commons in general are unable to support, in summer, so much stock as the arable and meadow land can, in winter; consequently, it is become impracticable to adhere, strictly, to the antient regulation: which antient regulation, however,

ever, though time has rendered it in most cases impracticable, is as strong an evidence, as is necessary to be produced, in favor of the herbage of unstinted commons belonging solely to the land.

That the idea is antient, and not of modern invention, may be seen in Fitzherbert ; who, in his 6th chapter, “ Of Foreign Woods, “ where other men have common, but where “ the lord may improve himself,” says, “ It is clearly ordained by the statute of “ Merton, and after confirmed by the statute of Westminster, that the lord shall “ improve himself of his wastes—leaving his “ tenants *sufficient* common. It is necessary to “ be known what is *sufficient common* ; and that “ to me seemeth by reason should be thus : “ To see how much cattle the hay and the “ straw, a husband getteth upon his own tene- “ nement, will find sufficiently in winter, if “ they lie in the house and be kept therewith “ all the winter season ; for so much cattle “ should he have common in summer ; and “ that is *sufficient common*. It consequently follows, that the occupier of a house without land could not, of right, keep cattle upon the common in summer ; because his tene-
afforded

afforded him neither hay nor straw, wherewith to keep them in the house, during the winter season.

Lastly, the interest of the *lord of the soil* requires consideration. Here, Fitzherbert's treatise may be taken as a safe guide. The groundwork, of the first seventeen chapters, is a statute of Edward I. named *Extenta Mannerii*; of which Fitzherbert himself gives the following account: "In mine opinion, this
" statute was made soon after the Barons'
" wars, the which ended at the battle of
" Evesham, or soon after, in the time of
" king Henry III. whereat many Noblemen
" were slain, and many fled, who after were
" attainted for the treason they did to the
" king. And by reason thereof their castles
" and manors were seized into the king's
" hands. And so for want of reparation the
" castles and manors fell to ruin and in decay.
" And when the King and his Council saw that,
" they thought it was better to extend them,
" and make the most profit that they could of
" them, than let them fall to the ground and
" come to no man's help and profit; therefore,
" King Edward I. ordained this statute to be
" made the fourth year of his reign, wherein
" is contained many and divers chapters and
VOL. I. F " articles,

“ articles, the which, at that time, were but
 “ instructions how and what they should do
 “ that were Commissioners or Surveyors in
 “ the same.”

Instructions, framed by Parliament, and explained by an able Judge, afford evidence of the highest authority.

A clause of the statute, respecting common pastures, runs thus : “ It is to be enquired of
 “ foreign pastures that be common how many
 “ and what sort of cattle the lord may have
 “ in the same, and what the pasture of a beast
 “ is worth by the year.”

It is this clause which Fitzherbert says is
 “ a dark letter to be understood without a better
 “ declaration ;” because there are three
 sorts of commons : namely, a stinted common
 close ;—a tended common, open to the common
 field ;—and the lord’s outwoods, or unstinted
 common pasture. In the two former, he says, “ the
 lord should be put to a certainty—and every man
 be stinted either by
 “ yard-lands, oxgangs, rents, or such other
 “ custom as the tenants use,—and the lord in
 “ like manner.”—But in the outwoods, “ me
 “ seemeth the lord should not be stinted nor set
 “ to a certainty, but put his cattle upon such
 “ manner of common pasture at his pleasure ;
 “ because

“ because the whole common is his own, and
 “ his tenants have no certain parcel thereof
 “ laid to their holdings ; but all only *bite of*
 “ *mouth* with their cattle :” by which is evidently meant (from various passages) *sufficient bite* for the tenants’ cattle. Hence, it clearly follows, that if the herbage of the common be *more than sufficient* for the cattle of the township, the overplus, be it more or less, belongs to the lord. On the contrary, if the herbage of the common is *not more than sufficient* to summer the cattle, which the township can maintain in winter (in an uninclosed state), the lord has not (*merely as such*) any interest whatever, in the *herbage* of the commons within his manor.

In another clause, respecting outwoods specially,—the statute orders, that it “ be en-
 “ quired of foreign woods, where other men
 “ have come-in, what part of those woods the
 “ lord may improve himself of, and of how
 “ many acres, and for how much the *vesture*,
 “ that is to say, the *wood* of every acre may
 “ be sold, and how much the ground is worth
 “ after the wood be fallen, and how many
 “ acres it contains, and what every acre is
 “ worth by the year.”

By this clause, it is implied by Parliament,

that the *wood* of a common belongs solely to the lord : and Fitzherbert's exposition of it implies the same idea : “ The declaration of
“ this statute is doubtful ; because of the
“ non-certainty of what is *sufficient common* ; ”
—which having explained as above, he continues, “ You shall understand that there be
“ four manner of commons, that is to wit ;—
“ common appendant, — common appurtenant, — common in gross, — and common
“ because of neighbourhood. Common appendant is where the lord of old time hath
“ granted to a man a meseplace and certain
“ lands, meadows, and pastures, with their
“ appurtenances, to hold of him. To this
“ meseplace, lands, and meadows, belongeth
“ common, and that is common appendant.
“ —Common appurtenant is where a man
“ hath had common to a certain number of
“ beasts, or without number, belonging to
“ his meseplace in the lord's waste : this is
“ common appurtenant by prescription, because of the use out of time of mind.—
“ Common in gross is where a lord hath
“ granted, by his deed, common of pasture
“ to a stranger that holdeth no land of him,
“ nor ought to have any common but by
“ reason of that grant by deed.—Common
“ of

“ of vicinity or neighbourship is where the
 “ waste grounds of two townships lie toge-
 “ ther, and neither hedge nor pale between
 “ to keep their cattle asunder : this is com-
 “ mon because of neighbourship ; and it is
 “ not used nor lawful to pin the cattle so
 “ going ; but in good manner to drive and
 “ chace beside such common.”

Of common in grofs, he says, “ the lord
 “ may not improve himself of any parcel ; for
 “ it is contrary to grant, though there be suf-
 “ ficient of common.” But “ ye shall un-
 “ derstand that how be it a lord may not im-
 “ prove himself of his waste grounds, yet may
 “ he lawfully fall and fell all the wood,
 “ broom, gorse, furze, braken, fern, bushes,
 “ thorns, and such other, as free-stone, lime-
 “ stone, chalk, turves, clay, sand, lead-ore,
 “ or tin, to his own use ; for the tenant may
 “ have nothing by reason of common, but
 “ only bite of mouth with his cattle.”

Hence, we may conclude, that the cutting
 of *fuel* (if practised) was, *then*, merely on suf-
 ferance.

In his explanation of a clause respecting
panage, &c. he says, “ Where this statute
 “ speaketh *de panagio*, that is to be understood
 “ where there is any mast growing in the

“ lord’s wood, whereby men’s swine may be
 “ fed and relieved; what profit that may be
 “ to the lord; for there is no man that can
 “ claim of right to have the mast, the which
 “ is a fruit, but the lord; and the lord shall
 “ have it in foreign or outwoods, as well as
 “ in his parks or several woods; and as the
 “ quantity of mast is, so the lord’s bailey
 “ ought of right to lay men’s swine there-
 “ unto from Michaelmas to Martinmas, and
 “ to make a true account thereof at the lord’s
 “ audit, what he taketh for every swine.”

Thus it appears, that not only *fuel*, but *panage*, likewise, was originally a matter of sufferance, when enjoyed by the tenants.

From these premises, and from the present *insufficiency* of commons, we may safely infer that the lord (merely as such) has no interest whatever in the *herbage* of commons within his manor. But we may infer, with equal safety, that of the *wood* of a common the lord is sole proprietor; *except* where a right of fuel and panage has been established by long custom; for, in this case, prescription has frustrated the original intention; and, here, the *houses* have a joint interest with the lord.

Lastly,

Lastly, with respect to *heaths* and *peat-moors*, from which the inhabitants of a township have, by prescription, a right of cutting fuel :

The statute orders, that it be enquired of moors, heaths, and wastes, what they be worth by the year :—and Fitzherbert says, “ Moors, heaths, and wastes, go in like manner as the herbage of the town ; for the lord’s tenants have common in all such out grounds with their cattle ; but they shall have no wood, thorns, turves, gorse, fern, and such other, *but by custom*, or else special words in the charter.”

We may therefore conclude, that the lord has no interest in the *herbage* of a heath ; nor in the *fuel* ; except there be *more than sufficient* for the use of the inhabitants of the ancient houses ; in which case the lord seems to have an interest in the overplus ; *provided* he can reap the benefit of it, without injuring the *herbage*.

From the sum of this evidence it appears, that, at this day, lords of manors, in general, have no other interest in the commons, within their respective manors, than in the *mines*, the *quarries*, and the *wood*. The *herbage* be-

longs to the land ; and the *fuel* (where custom allows it to be taken) to the houses.

As to the *right of soil*, it appears to be merely *honorary* : for the soil cannot be removed, nor turned to advantage, without destroying or injuring the *herbage*. A lord of a manor has, however, a *claim* upon the *soil*, though indirect : for no man, nor set of men, can break it without his consent. But this seems to be a claim of *honor* rather than of *interest* ; for, while the commons remain open, he cannot, in strict legality, reap any *emolument* from it.

Thus we have enumerated five distinct interests.

I. COMMONRIGHT LANDS* HELD WITH
COMMONRIGHT HOUSES. To these lands
the

* By COMMONRIGHT land is meant the original common field and common meadow land, and such other land, lying within the township, as has, by grant or prescription, a right of commonage when held with a commonright house ; in contradistinction to such lands of the township as have not, and to the lands of the rest of the kingdom which never can have, by any legal act, such a right, though held with a commonright house. Suppose nine tenths of the township in a state of temporary alienation, by some legal circumstance which could not be avoided, or by any circumstance whatever, could the other tenth part catch the opportunity

*the benefit of the herbage belongs, in proportion to their value ; and the right of the respective parcels, to share in a division of the lands, ought to be ascertained by their intrinsic quality, and their affinity to the common (where this operates on their value in the open state) taken jointly *.*

2. COMMONRIGHT LANDS HELD WITHOUT COMMONRIGHT HOUSES. The original right of these lands was indisputably the same

tunity in the interval of suspension, and appropriate the lands of the commons to this one tenth of the township? It would be absurd to suppose it. If one tenth cannot by any advantage choose the other nine, why should nine parts of a township be suffered to share the right of the tenth? See p. 52.

* To set aside the lands of the township entirely (as in the case of Pickering) is too absurd to be treated of seriously. Suppose nine acres of ten, or ninety-nine of one hundred, of a given township, to belong to one house, and the other one-hundredth part to be divided among two hundred and fifty-nine houses: or suppose the commons of a given township to contain many thousand acres, and the appropriated commonright lands to consist of 2376 acres; that the commonright houses of the township were only two, and that 2370 acres of the appropriated lands belonged to one house, the other six acres to the other house; would it be equitable in either case to divide by the houses? If not in these cases, why in any case where the principle of right is precisely the same?

same as that of the other lands of the township; and their *temporary alienation* is merely a circumstance, which does not extinguish, but only suspends, their right to a *benefit of the herbage*. Whatever this temporary alienation depreciates them, below the other lands of the township of the same intrinsic quality, in similar situations, so much proportionably less is their right to a share of the *lands* of the common *.

3. COMMONRIGHT HOUSES. The proportional rights of houses depends on the nature of the commons to be inclosed.

If they produce *herbage alone*,—a commonright house ought to share with the lands, in proportion to its *extra value* as such; that is to say, whatever it is worth more than a non-commonright house of the same *intrinsic* value, in a similar situation, so much it ought to be estimated at, in the general valuation

* The depreciation here intimated will seldom take place; for the appropriated lands of a township are worth more to the occupier of a commonright house; because they entitle him to a greater share of the common pasturage, than to the occupier of a non-commonright house, to whom they can seldom give any adequate privilege.

valuation of the commonable property of the township *.

If the common to be inclosed produce *fuel alone*, the houses (or the houses and the lord of the soil, if an overplus can be proved) are alone intitled to it.

If *herbage and fuel jointly*, the lands and houses have rights in it, proportioned to the herbage and the fuel it produces †.

4. COMMONRIGHT SITES. The right of sites is similar with that of houses: whatever the dormant right of presentation and the dormant right of fuel are worth, so much in proportion they ought to share with the lands and houses.

5. The

* The *extra value* of commonright houses varies with the value of the commons and the number of houses. Thus, suppose the commons of two distinct townships to be of equal value, and that one township contained ten, the other one hundred commonright houses; the right of presentation would be worth more in *that* than in *this* township: and where herbage alone is the produce of the common, the right of representation and the extra value are the same.

† If part of the commons to be inclosed produce herbage alone, and other parts principally fuel, and a separate division be made (as in the case of Pickering), the *extra value* is compounded of the right of presentation to the herbage, and the right of cutting fuel; either of which being estimated, the other is of course sufficiently ascertained.

5. THE LORD OF THE SOIL. To the lands of a common, on which *open woodlands* still prevail, the lord of the soil has a principal right. But whatever the *bite of mouth* is worth, so much in proportion the *land* is entitled to ; and if a right of *fuel* be established by custom, the *houses* have their claim. Whatever proportional advantage the several interests would receive, in an open state, such proportions of the land they are severally intitled to, under an inclosure.

If *valuable mines* and *quarries* be given up, the lord ought to receive an equivalent, in *land*, and is entitled to some share, for the mere *chance* of mines, and quarries, being hereafter discovered. But of *naked commons*, affording neither wood nor fuel, and of which the mines and quarries are reserved, the lord of the manor (merely as such) has not, on the principles offered, any right to share in a division of the soil, saving the honorary right which has been already mentioned*.

While

* In the case of Pickering, the Crown, as owner of the "honor, forests, and manor of Pickering" (in right of the dutchy of Lancaster), had *one tenth* of the principal part of the township, and *one fifteenth* of the remaining part, granted by the act of Inclosure.

The

While the PICKERING BILL is before me, I will make a few further remarks.

1. *Five commissioners appointed*: three of them, only, being directed to value the common lands, and to set out the king's allotments. Of these three, one was nominated by the chancellor of the dutchy of Lancaster; one by the lessee of the tithes (who could have no special right of nomination, as no part of the commons was ordered by the act to be set out as tithes); and the third by the proprietors of the township. Before the lands were valued, and the allotments set out, the commissioner of the tithe-lessee obtained an appointment under the Crown; in
con-

The woodlands, in this case, had formerly been inclosed and held by the Crown in severalty; and the remainder of the commons given up entirely to the appropriated lands of the township; shutting out even the park, and some demesne land of the dutchy, from a right of commonage; so that neither *wood* nor *woodland* is by the act given up: yet *all the manerial rights* are reserved; except the *honorary right of soil*, and except *quarries of stone and slate*: which last are sufficiently abundant in the old appropriated lands to supply the township with building materials and lime manure for at least a thousand years. Therefore, the consideration given up was of inconsiderable value—compared with that which was given as *equivalent*; but which appears to be, *in this particular case*, unreasonable and excessive.

consequence of which the township was in effect valued, and the Crown allotments set out, by the agents of the Crown, without the proprietors of the township having, in any case, a casting vote ; their commissioner becoming, under these circumstances, a mere by-stander.

It would be well if, in cases of importance, *honorary commissioners*, chosen out of the independent gentlemen of the neighbourhood, could be appointed ; as a check upon acting commissioners, in predicaments of this nature.

2. New *roads* to be made, and old ones to be repaired ; — common drains to be opened, and *public reservoirs* formed, by the commissioners, at the joint expence of the lands to be inclosed.

The forming of reservoirs of the waters collected by the roads, for the purpose of public drinking pools, ought to be a standing clause in every Inclosure bill ; and commissioners, most especially in upland situations away from running waters, ought to pay due attention to it.

3. Lands, exceeding the yearly value of three shillings an acre, to be divided and *inclosed*, — the residue to be *allotted, only* ;
leaving

leaving it in the option of the persons to whom they be allotted, to inclose them, or let them remain in a state of open common ; subject to such regulations as the commissioners shall appoint.

Too much cannot be said in praise of this distinction. Good land will always pay for inclosing, and be the most valuable in that state ; but bad land is frequently too dear at that price : many men of comfortable fortunes have, in this District, been beggared, and the fortunes of others injured, by the inclosing of lands which have not yet paid, nor probably ever will repay, the expence ; and the same may be observed, in other Districts of the kingdom.

4. A good regulation respecting *fences* is likewise noticeable. The act allows a privilege of placing a fence, on the outside of the ditch, upon the adjoining allotment, to defend the face of the young hedge ; and to remake and remove such fence during and within the space of ten years. Also to continue the fence at the ends (by rails reaching over the cross ditches (to the posts or rails of the adjoining cross fences.

5. Lastly, the reference of matters in dispute

pute to a *trial at law* requires the most mature consideration.

The appropriation of commonable lands is an important matter : they are useful, in an open state ; but would, in general, be much more useful, in a state of Inclosure. Whoever has reaped a rightful benefit from them, time immemorial, ought to have that benefit continued to them : and all that Parliament has to do is, to ascertain the quantity of right, of each party or interest concerned, in the particular bill before them ;—*or* to refer special matters, in dispute, to some other inquest, more peculiarly adapted to the necessary enquiries ;—*or* to refuse the application.

A court of assize is, perhaps, the most improper inquest, which could be referred to, for settling disputes respecting Inclosures : and are, certainly, much less adapted to make the necessary enquiries, than a committee of the House of Commons ; where every Member is a *judge*, and has sufficient time for deliberation ; whereas, in a court of assize, all is hurry and tumult ; with only *one* man to think, and the mind of this one man necessarily crowded, with a chaos of ideas.

It

It will however be said, that a special jury, of the county in which the site of Inclosure lies, are the fittest to determine the rights of the claimants. This, in theory, is plausible ; but is seldom verified in practice.

In the case of Pickering, only four of the special jury attended ; and one of these was a tradesman of the city of York. It is highly probable, that not one of the jury resided within twenty miles of the site of Inclosure ; or had the smallest share of personal knowledge, either of the site, or the subject of Inclosure. A jury impanelled, in any other county of the kingdom, might have been equally qualified for the purpose.

It was therefore a *mere trial at law*, which, to a proverb, is a game at hazard. The houses were, once, within a point of losing the game : Sir Thomas Davenport died, and Mr. B. (their two leading counsel) was put under arrest, the day before the trial was to have come on ; and their agents, sanguine as they had heretofore been, now, on those *accidents* happening, gave themselves up to despair. But, by *chance*, or by *management*, the trial was postponed. The houses, now, came into court, fully prepared, while the land, by a train of *ill luck* or *bad management*,

was, in effect, left without an advocate ; and, solely by “ the uncertainty of the law,” lost its right. Even the house owners, themselves, considered the verdict as a game artfully won — and their *large* allotments, as plunder bravely got. Right was out of the question : the idea of it had been absorbed, long before the decision, in rancour and ill blood ; a circumstance more to be lamented, than the inequitable division of the commons.

In the case of KNARESBOROUGH, too, a dispute, between the land owners and house owners, was ordered to be decided by *legal contest*. There, as at Pickering, the houses * claimed the whole ; but the lands *happening*, in that case, to employ the better forces, they gained the day. Almost the whole forest was divided among the land owners : even a messuage

* In this case the houses were divided into *messuages* and *cottages*—one messuage was considered as equal to two cottages. This distinction, which is not uncommon, has most probably arisen from the circumstance of the woodlands being grubbed for the sake of herbage. A messuage, namely, a house with which land was anciently occupied, had not only a privilege of cutting *fuel* in the outwoods, but, of necessity in early days, a privilege of taking *plowboot*, *cartboot*, &c. Hence, its claim upon the *herbage* which succeeded the *wood* became greater than that of a mere cottage, with which no lands being occupied, had no use for implements of husbandry.

messuage did not share, on the best land, more than two acres. The land owners had offered the house owners a greater proportion; but they chose to take their chance in a court, as other desperadoes take their chance in a lottery—a landed estate, or nothing; and, it is said, what some of them got did not pay their extra expences. Here, the *poor* man lost his right: a circumstance which renders the case of Knaresborough *harder* than that of Pickering.

These are facts which appear to be sufficiently striking, to induce Parliament to establish some GENERAL PRINCIPLES OF INCLOSURE, and to enquire, themselves, into the rights of claimants: or, if a committee of Parliament cannot conveniently determine, to order reference to a commission of independent disinterested men, in the immediate neighbourhood of the site of Inclosure; who, having personal knowledge of the premises, and the claiming parties, are best enabled to judge of their respective rights: or, if the opposition in Parliament be strong, and the matters in dispute too weighty to be left to reference, to send back the petitioners, and let the commons remain open. It does not

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follow,

follow, that because a few individuals, instigated, perhaps, by one more interested than the rest, take it into their heads to try their fortune in a Bill of Inclosure, that a suite of valuable commons should of necessity be inclosed. A few years might reconcile differences in opinion ; and, then, there might be no difficulty in assigning every man his rightful share.

The fate of SINNINGTON was determined by that of Pickering ; the different interests having agreed, previously to the trial, to abide by the decision of the court.

The Sinnington bill is entitled to a few remarks :

1. *Tithe.* It is difficult to write with temper on the subject of tithes. At the time they were instituted, specie was little in use, as a medium, between the producer and the consumer of the productions of the soil ; and then it might be necessary, that the clergy should be supported out of its immediate produce. But to continue this ancient regulation, in a time when money is become the universal medium of property, and when improvements in cultivation engage the attention of all-ranks of mankind, is an impropriety,

propriety, which none but the abettors of oppression will defend.

A general dissolution of tithes, though fervently to be desired, is not probably yet near at hand : the bugbear *innovation* is, at present, too terrible in the eyes of the Many : but, under the circumstances of the present times, to *increase* the quantity of titheable lands, as in the case of appropriating commons without assigning some certain part of them, or *some other equivalent*, in lieu of tithes, is a *crime* which posterity will never forgive.

In the case of Sinnington, every thing is done which, under the false principles of the bill, could be done : indeed more ; for even the general principle of the bill was broken into, with respect to the tithes. The act assigns *one tenth* of the commons *for the tithe of the commons* ; and, afterwards, empowers the commissioners to set out a further parcel of them, for *half* the tithes of the old-inclosed lands of the township, belonging to the commonright houses : which is, in effect, giving so much of the commons to the commonright *lands*, independent of the *houses*. And further authorises the commissioners to award a perpetual modus or

G 3

money-

money-payment, in lieu of *the other half* of the *commonright lands* ; and for the *whole* of the *dormant lands* ; namely, such lands as had not, some time previous to the passing of the bill, a commonright house *belonging* to them*. Thus the entire township is freed, for ever, from a species of oppression, which the whole kingdom is entitled to be relieved from.

2. *Lord of the soil.* The Sinnington Bill assigns one *five-and-twentieth* for the *right of soil* only ; all other manerial rights whatever being reserved. No *quarries*, or known beds of *marl*, &c. on these commons.

3. *Denizen right.* The priory of Keldholm, which anciently stood at a short distance from these commons, without the boundaries of the township of Sinnington, had a right or freedom of commonage, for sixty beasts, and four hundred sheep. This right has, of late years, and perhaps ever since
the

* The false ground of this distinction has been already shewn. Suppose a transfer of a principal part of these lands to have taken place (through ordinary circumstances, without any sinister views to an Inclosure) about the time the exclusion of right takes place,—would the mere *circumstance* of fixing the particular day of exclusion twenty-four hours before or twenty-four hours after the day of transfer, alter, either one way or the other, the *natural right* of such lands to share in the benefits of the Inclosure !

the dissolution of the priory, been exercised in part, but never perhaps wholly. The Earl of Scarborough, who is at present in possession of this right, has received little more than a yearly acknowledgment: nevertheless, on a division of the commons, his claim became important; for the ancient right, in its fullest extent, was equal, perhaps, to half the pasturage of the commons under inclosure.

In this case, the dictates of common prudence would have led the promoters of the bill to have fixed the quantity of right, before they went to Parliament. This, however, was neglected, and all the act empowers the commissioners to do, in this respect, is, to examine into the merits of the claim, and set out such a part of the commons, as appears to them to be a compensation. The consequence is, an injunction has been granted to stop proceedings: through which circumstance the inclosure is at a stand, to the great inconveniency of the township. A certain and considerable expence is incurred—commonable stock sold off—and fencing materials prepared—without, at present, any certain advantage accruing; a predicament this, which ought to caution the promoters of Bills of Inclo-

sure, to have a clear understanding with the several interests concerned, before they burden the township with the expences of a bill, and the consequent inconveniencies.

4. *Alien claim.* Another claim is made upon these commons—by the owner of a farm which lies by the side of them, and whose stock has, time immemorial, been suffered to depasture upon them. It is supposed that this encroachment has been made thro' the means of a *windrake* * across a corner of these commons, to a river which runs at a distance; or that it has been suffered to take place, through mere neglect: let this be as it may, it ought to be a lesson to uninclosed townships, to attend to the stock of their respective commons. I term it an incroachment, because there is not a more general position, than that the commons of a given township belong, in original right, to the lands and houses of that township, and that no right of commonage can be justly claimed, by the lands and houses of another township, unless a special grant, or something adequate to it, can be produced. Custom may, in this case, be considered, in law, as adequate to a grant;—
although,

* See ESTATES AND TENURES.

although, in equity and common sense, it might seem more reasonable to award damages, for a trespass, than a portion of the commons, as a compensation.

5. *Fencing*. The whole to be inclosed, within six months from the time of staking out. Counter fences may be made upon the adjoining allotment, and over the terminating cross ditches *. Sheep to be kept out of the new inclosures, during the first seven years; and all kinds of stock out of the lanes, during ten years;—after which time, the surveyors of the *roads* of the township may let the grass of the lanes and bye-ways, and apply the rents to the repair of the roads:—an admirable clause!

6. *Appeal*. By this bill, persons aggrieved may appeal to the Quarter-Sessions; except in such cases where the determinations of the commissioners are directed to be final. This, *in some cases*, may be a check upon the acting commissioners; but is far from being equivalent to a special commission of gentlemen, resident in the neighbourhood, who would, *in all cases*, be on the spot, to be appealed to. To do strict justice to every individual, in a complicated business of this nature,

* See Page 79.

ture, is beyond the power of abilities and honesty to accomplish ; but the nearer this summit can be approached, the better ; and every probable means should be employed in attempting it.

In the case of MIDDLETON, *half* the commons were assigned to the HOUSES, *half* to the LAND, in proportion to the *land tax* : a mode of division which has, I believe, been pretty generally adopted in the Vale.

This method of apportioning the shares of the land owners is, in townships where the land tax is levied by rack rents, more equitable, than it is in cases where it is paid by ancient valuation, as it was in Middleton when the Inclosure took place : but it cannot, in either case, be strictly equitable ; nor approach so near to strict equity, as a valuation according to circumstances, at the time of inclosure.

On *this*, alone, an equitable division of commonable lands can be made : not with respect to land, only ; but with regard to every other species of commonable property. WHATEVER BENEFIT THE SEVERAL INTERESTS, AND THE INDIVIDUALS OF THE RESPECTIVE INTERESTS, RIGHTFULLY ENJOYED, PREVIOUSLY TO THE INCLOSURE,

SURE, OR WERE, *in reversion*, RIGHTFULLY ENTITLED TO, (AS DORMANT LANDS AND HOUSES), SUCH PROPORTIONAL BENEFIT THEY ARE SEVERALLY ENTITLED TO, UNDER AN EQUITABLE APPROPRIATION.

BEFORE I take leave of this subject, I will note the effects of the three different means of Inclosure, which have been, in different townships, made use of, in this District : namely,

1. Inclosure by Exchanges, &c.
2. Inclosure by private commission.
3. Inclosure by Act of Parliament.

1. INCLOSURE BY EXCHANGES. In the northwest division of the Vale, the common fields and common meadows have mostly been inclosed, progressively, piece after piece ; either in the original slips, singly ; or more than one of them have been joined by purchase, or by private exchanges between the several proprietors : by which means the whole of the appropriated lands of the townships, in which this species of Inclosure has taken place, have been, in process of time, inclosed and held in severalty.

This method of Inclosure is attended with at least one disagreeable consequence. The
common-

common-field lands having lain principally in single ridges, some of them, perhaps, near a mile in length, the Inclosures are badly proportioned. They are either too long for their width, many of them resembling lanes rather than fields; or, if cut into lengths, there are no driftways to the inner divisions:—besides, much unnecessary fencing, with all its attendant evils, is by this mode of Inclosure incurred; and what is yet worse, each man's property is still, perhaps, scattered over the township.

2. INCLOSURE BY PRIVATE COMMISSION. Some entire townships (except perhaps the unfenced commons), and many stinted pastures, have been laid out by commissioners, chosen unanimously by the several interests concerned, without soliciting the assistance of Parliament.

By this means, the distinct properties are laid together, in well sized and well proportioned Inclosures, with proper roads and driftways; and this without the expence, the inconveniency, or the *uncertainty* attending an application to Parliament.

3. INCLOSURE BY ACT OF PARLIAMENT. By this expedient, the advantages abovementioned are obtained in their fullest extent;

extent; but they are unavoidably burdened with a train of attendant evils, which render this mode of Inclosure much less eligible, than that of inclosing by *general consent*.

This, however, is frequently impracticable: obstinacy has its adherents, in every township; and where various interests are concerned, as in the case of dividing unstinted commons, it is scarcely possible that every interest, and every individual of each interest should be of one mind. Therefore, without *some* exertion of legal authority, unstinted commons, in general, must continue to lie open.

But it does not follow that, because some is necessary, much should be used. It may be received as a sound position, that in cases where an Inclosure would be highly beneficial to a township at large, a great majority of the individuals concerned would forward a measure, evidently calculated to promote their own interest; provided they could obtain it by some *certain* and *known* means. It is the idea of giving up a *certain*ty for an *uncertain*ty, of entering the list of contending interests, and of being outwitted or overpowered by their neighbours, which deters men, whose fortunes are not desperate, and
whose

whose dispositions are peaceable, from engaging in *contests* about Inclosures.

At present, a notice of a petition to Parliament, for the appropriation of unstinted commons, implies the war-hoop—*bavock*!—and he's the best fellow who gets the most plunder. And, until some GENERAL LAW OF INCLOSURE be established, this *uncivilized* mode of procedure must necessarily continue.

The multiplication of statutes has ever been spoken of as an evil; and though public acts may in general be meant, private bills may properly be included. There needs no apology, therefore, for venturing to recommend one Act of Parliament which would preclude the passing of a thousand.

Parish Bills of Inclosure must occupy much of the attendance of Parliament, and divert their attention from matters of more public importance. Besides, private interest, although it may not be able to exert its influence in Parliament at large, may be difficult to shut out, entirely, from its committees: but what can lower the dignity of Parliament more, than private interest being permitted, in any way, to warp its determinations?

That

That a GENERAL BILL OF INCLOSURE might be framed, to answer the purpose of an equitable appropriation of commonable lands, in a much higher degree, than has been, or perhaps ever can be obtained, by separate bills, appears, to my mind, indubitable ; and why such a measure has not long ago been adopted, would be difficult for any man, out of Parliament, to conceive.

It would be improper, in me, to dictate to Parliament, and might be wrong to offer my sentiments, too freely, in this place ; but having ventured to censure the present mode of Inclosure by Act of Parliament, it is incumbent on me to convey some idea, of what I conceive would be an improvement.

In every township, FOUR DISTINCT INTERESTS claim a right of sharing in its commonable lands : namely, *lands, houses, tithes*, and the *lordship*. The two former have a benefit in commons, in their open state ; but the benefit of the other two arises, solely, out of the Inclosure *. Hence it follows, that
it

* The tithe of wool, lamb, and milk, only excepted ; articles of small value, compared with the tithe produce of lands, in a state of cultivation.

1796. If, in any case, as in the appropriation of marshes or fens, the estimate value of the tithes should be greater,
in

it is the consent and approbation of the two former interests, which ought to be obtained, previously to a change from the open to the inclosed state ; for the two latter may be supposed to be always ready to receive proposals for an Inclosure.

It has already been seen, that when the tithe and the lordship are able to draw over to them a third interest, they can gain the desired point. But the evil effects of Inclosures, thus conducted, have also been seen. Therefore, in fixing a general rule, for the QUANTITY OF APPROBATION requisite to an Inclosure, the other interests are more particularly to be attended to.

Were the lands and the houses equally situated, with respect to the commons to be inclosed, *a majority* of each might be sufficient. But this not being the case, in any township, a larger proportion seems necessary. *Three fourths* might, in many cases, be too small ; but as Inclosures are, in all human probability, beneficial to the public, it might be impolitic to fix it higher.

Thus

in the open than in the inclosed state, the owners of such tithes ought not only to have a dissentient voice, but to have a suitable recompence.

Thus it appears to me, that, in framing a general law of Inclosure, *three fourths, in value, of the land, and three fourths, in number, of the houses,* with the consent of the lord of the soil, ought to be considered as the requisite QUANTITY OF APPROBATION.

Authorized and guided, by a general law of this nature, the business of Inclosure would be safe and easy. Every man, before he set out, would know, with certainty, his proportional share ; and the Act would empower the several interests to make choice of commissioners, to secure to them their respective rights.

Numberless Inclosures remain yet to be made ; and it were much to be regretted, that the attention of Parliament should be so unprofitably employed, and that the property of individuals should be subjected to so much hazard, as it is to be feared they will be, while common lands are continued to be appropriated, by SEPARATE BILLS, without any ESTABLISHED PRINCIPLES OF INCLOSURE *.

VOL. I.

H

FARM

* June 1796. During the last session (1795-6), a Bill, of the intention here proposed, was brought into Parliament, by the President of the Board of Agriculture. But Parliament being dissolved, before the Bill had passed the lower House, it now remains in suspense, for the decision of the new Parliament.

4.

FARM BUILDINGS.

I. THE BUILDING MATERIALS,
which are now in common use, on *this* side
of the Vale, are chiefly,

Stones,
Pantiles,
Deal :

But there are other materials, which require
to be noticed ; namely,

Bricks,
Cement,
Oak.

I. STONES. The stones, in use, are of
two kinds : *freestone* and *limestone* *. The
former

* In the quarries from which these materials are drawn,
the limestone generally forms the upper stratum, rising to
within a few inches of the surface. The soil, itself, is ge-
nerally a limestone gravel ; under which is frequently
found a stratum of thin statelike limestone, that increases in
thickness, as the depth increases ; from one to four or six
inches thick ; lying, in general, loose and horizontal.
These are the " walling stones " used in the faces of build-
ings ;

former being less perishable, are used for foundations, coins, cornices, and the coping of ridges and gables; the latter, being more easily raised, and requiring less labor in dressing them for use, are, in farm houses at least, generally used in facing the walls; and when properly hammered, and properly sorted, so as to give the thickest to the lower courses, lessening the size of the stones, from five or six to three or four inches thick, as the building rises, a much *neater* material cannot be employed; nor, if kept free from constant moisture, one which is more lasting, or which preserves the face of youthfulness so long.

2. PANTILES. Formerly, *straw* and a heavy kind of *slate* were the common coverings; but, of late years, *pantiles* have become universal, for ordinary buildings; and *blue slate* for better houses.

In the southern counties, pantiles are considered as an ordinary material: but the

H 2 estimation

ings; for which use, one of their edges is *hammered* into a bricklike form: an operation somewhat tedious; but not equal to that of *chiselling* freestone. Under the walling stones, an irregular limestone rock (of many feet in depth perhaps) is usually found; and, under this, a bed of grit, or freestone, of unfathomed depth.

estimation of them, there, arises from an improper method of using them ; not from any intrinsic demerit of the material itself, when properly manufactured. From London to Grantham in Lincolnshire, scarcely a roof of pantiles occurs : north of Grantham, they are become the almost universal covering. They have two qualities sufficiently valuable to recommend them in any country : cheapness and lightness.

Much, however, depends on the *manufacturing*, as well as on the *laying*, of pantiles. If the materials be not sufficiently exposed to the action of the air ; or, if of dissimilar natures, though sufficiently tempered, they be not united *sufficiently* into one homogeneous mass, or uniform substance, the tiles that are made from them are liable to perish ; not only before burning, as well as in the kiln, but after being exposed to the influence of the atmosphere, upon the roof of a building. Or, if the materials be good and well prepared, the moulds be truly made, and the moulding skilfully executed ;—still, if they be suffered to warp in drying, or to twist in being set injudiciously in the kiln, they are wholly unfit to be laid on, as a covering material ; and every judicious workman refuses them.

them. Were workmen, in general, or those who have the superintendency of workmen, more scrupulous, in this respect, than they generally are, manufacturers would be more diligent in their endeavours to approach the standard of perfection ; by which means this, in many cases, most eligible covering might grow into universal estimation.

3. DEAL. In a District, furnished with three considerable sea ports, and a river navigation, it is no wonder that deal should have been long in use, as a building material. Floors have been laid with it, for near a century ; and, of late years, it has been used for almost every purpose of building. Beams, joists, and entire roofs, are now, almost universally, made of fir timber.

4. BRICKS. Where stones are far to be fetched, as towards the center of the Vale, bricks are become a common material. If brickearth be found near the site of building, as it generally may in situations where stones are scarce, clamp bricks are considered, in this country, where coals may be had at a moderate price, as the readiest and (all things considered) the cheapest walling material.

5. CEMENT. Formerly, ordinary stone buildings were carried up, entirely, with

“mortar ;” that is, common earth beaten up with water, without the smallest admixture of lime. The stones, themselves, were depended upon as the bond of union ; the use of the “mortar” being merely that of giving warmth to the building, and a degree of stiffness to the wall.

The event, however, proves that walls built without lime have, in many instances, stood for ages. Even part of the walls of PICKERING CASTLE, formerly esteemed a fortress of considerable strength, have been carried up with a cement, which, to *appearance*, seems little superior to common mortar : nevertheless, such is the effect of time, upon walls which are exposed on every side to the atmosphere, that they now hold together with considerable tenacity.

To this effect of time ; or, more accurately speaking, to certain laws of nature which, in process of time, produce this effect ; we ought, perhaps, to ascribe the stonelike contexture of the cements of ancient walls, rather than to any superior skill in preparing them.

The citadel, or central stronghold, of the fortress under notice, has been built with better cements ; which, however, vary much
in

in outward appearance. One specimen, which I have collected, is a smooth chalklike substance; another, a coarse rough mass, composed of sand and small gravel, with a smaller proportion of chalklike matter.

In the fosse, which surrounds the outer wall, lies a fragment (perhaps part of the parapet or embrasures of the outside wall), whose cement has acquired a stonelike hardness, especially the part which is exposed on the outer surface*.

I have bestowed some attention on the decomposition of these four specimens. The results are as follow:

EXP. I. CEMENT OF PICKERING CASTLE:
—the *coarser* specimen, taken from the ruins of the *central tower*.

In *general appearance*, it resembles dirty chalk, thickly interspersed with small gravel; some of the granules as large as peas. Its *tenacity* that of common writing chalk; the asperities easily broken off with the fingers.

H 4

One

* The age of this fortress would perhaps be difficult to ascertain. Part of the outer wall was repaired and some towers raised by (I think) Edward VI. But when the parts, which are here the subject of notice, were erected, is probably uncertain. They are said to be of very great antiquity; and are worthy of the research of the Antiquary.

One hundred grains, pounded, dried, immersed in water, and balanced together with the menstruum, lost in solution $25\frac{1}{2}$ grains of air, and yielded by filtration 40 grains of residuum; which afforded, by elutriation, 35 grains of gravel and rough sand, and 5 grains of suspendible mudlike matter: the solution yielding, by precipitation, 64 grains of calcareous earth.

35 grains of sand and gravel,

5 grains of silt,

64 grains of pure chalk,

104 grains.

From this analysis it appears,

1. That the *proportion* in this case (supposing crude limestone in lumps fit for burning to be of equal weight with sand and gravel) was three measures of unslaked lime in lumps, to two of sand and gravel.

2. That the sand and gravel, in this case, had been *washed*; either by the brook, which runs at the foot of the Castle mound, or more probably, by hand; the proportion of dirt being smaller than that which is generally found among *drift sand*.

3. That the lime had not regained the whole of its *fixt air*. The increase of weight, which

which appears in the synthesis of this experiment, is a sufficient evidence, were it not corroborated, even unto proof, by the deficiency of air thrown off in the solution. To try whether the increase, on one hand, and the deficiency, on the other, agreed as to quantity, I resuspended 50 grains of the chalk obtained in this experiment: it lost exactly 23 grains in solution; as $50 : 23 :: 64 : 29\frac{1}{2}$. Therefore, the increase of weight, in this case, appears to be wholly owing to the deficiency of air.

EXP. 2. CEMENT OF PICKERING CASTLE;
—*finer specimen of the central tower.*

General appearance that of stale lime, run together with water, and baked to a crust: almost a pure white: surface rough; shewing the cells and the unbroken granules of the original lime.—*Contexture*, more brittle than common chalk; full of pores; the materials do not appear to have been well incorporated, at the time of preparation.

One hundred grains yield, in decomposition, twentyone grains of air.

42 grains of whitish grit,

5 grains of suspendible dustlike particles,

56 grains of pure chalk.

103 grains.

OBS. The residuum, in this experiment, is evidently *the powder of freestone*. The particles are small, and of irregular figures; very different in appearance (when magnified) from common sand. I was at a loss to ascertain their nature, until pounding some freestone, and washing it in the manner I had done the residuum, I found it to resemble exactly the fortytwo grains of washed grit of the experiment. It appears to have been pounded or ground very small, and to have been put through a fine sieve; the whole being in a state of *grit*; no fragment so large as a pin's head.

It is observable, that the cement of this experiment is *weaker* than that of the last: but whether from the nature of the *base*, or from the *proportion* of lime being less, or from the two united, is not evident.

It is also observable, that, in the decomposition of this specimen, a urinous smell rose, during the solution; and that the edges of the first filter attract moisture from the air. It is at present a practice, among some plasterers, to make use of urine in the preparation of plaster.

EXP. 3. CEMENT OF PICKERING CASTLE:
taken from the ruins of the *old outer wall*
facing

facing the northwest. Collected in three or four different places ; a few feet above the foundation ; and mostly from the inner parts of the wall (where it has parted) ; not from the outer surface.

Its *appearance* is that of sandy loam, interspersed with specks of chalk ; some of them larger than peas. Its *fragility* similar to that of dried brickearth.

One hundred grains of this specimen yield thirteen and a half grains of air.

30 grains of rough sand, and a few large fragments,

37 grains of silt and fine sand,

36 grains of calcareous earth,

103 grains.

Obs. There are two causes of the *weakness* of this cement : the small *proportion* of lime, and the impurity of the *base* : a heterogeneous mass of fragments of various kinds, some of them apparently gypseous ; of sands of different species, principally of a crystalline aspect ; but chiefly of mere mud, or of sand so fine as to be impalpable between the fingers. It is therefore evident, that the materials, in this instance, have *not* been *washed*.

Exp.

EXP. 4. CEMENT OF PICKERING CASTLE:
taken from a *fragment* in the northwest corner of the fosse.

In *general appearance* somewhat resembling the last noticed specimen; but in *contexture* very different. The crust of the outer surface, which has been exposed to the influence of the atmosphere, probably, during many centuries, has acquired almost the hardness of limestone: nor is any part of it to be broken with the fingers: nevertheless, this specimen, also, is full of lumps of unmixed lime; some of them the size of small hazel nuts, and, at the time I took the specimen (the season wet), as soft almost as butter; when dry, they are of the consistency of very soft chalk.

One hundred grains of this specimen yield fifteen grains of air.

8	————	grains of fragments,
12	————	coarse sand,
36	————	fine sand,
3	————	of a sizelike matter,
45	————	chalk.

104 grains.

OBS. The constituent parts of this residuum resemble those of the last specimen; except-

excepting the absence of the mud, which has evidently been *washed* away; and excepting the presence of a mucilaginous matter, whose nature I am not at present able to guess; nor have I leisure, at present, to pursue the enquiry.

GEN. OBS. I. All these cements, whether weak or strong, have laid hold of the stones with a degree of firmness proportioned to their respective strengths. Every crevice of the wall is filled with cement: the whole form one united mass.

Hence, it is more than probable, that these cements have been poured into the walls, in a liquid state, in the state of *puddle*; and they appear to have operated, with respect to compactness, as the *puddle* of the canal-makers.

2. The subjects of Exp. 3. and 4. are strong evidences, that, in the preparation of these puddles, the antient builders were very deficient. Not more than half of the lime they contain appears to operate. The lumps, whether large or small, are *more* than wasted; weakening, rather than strengthening, the cement.

3. From the whole of these experiments, it is evident, that the several cements had acquired the principal part of their fixed air; chiefly,

chiefly, perhaps, after they were deposited in the buildings. The air in the stronger specimens bears a considerable proportion to the entire quantity of cement; and being insinuated, in the close state above-mentioned, may have added greatly to its *compactness*.

Hence, it is highly probable, that the stonelike tenacity of old cements is chiefly owing to the transmutation of lime and sand to calcareous earth and sand,—a substance resembling the original limestone.

On examining a wall, which has been built with loam alone, without any admixture of lime, and which has probably stood about a century, I find that the loam has laid no hold whatever of the stones, and that time has made no alteration on its contexture. It is still the same friable substance, it probably was, the day it first became dry in the building; without having the smallest appearance of acquired tenacity, obtained during the century of time it has been exposed to the influence of the atmosphere.

It is therefore probable, that the atmosphere imparts nothing, *voluntarily*, of a cohesive nature to the mortar of walls which are exposed to it.

But it is more than probable, that cement,
con-

containing a portion of *lime*, imbibes from the atmosphere something, which gives it a degree of tenacity, superior to that which it had on its first becoming dry in the wall; and it is a fact, well established, that lime begins to imbibe, the moment it grows cool from the kiln, *that* which the fire has deprived it of; namely, fixed air; which fixed air being imbibed, after the cement is deposited in the walls, is, *probably*, a principal cause of tenacity.

This being admitted, it may seem to follow, that the more quickly it is transferred from the kiln to the building, the greater portion of air will be imbibed, after it is laid in the walls, and, of course, the greater effect will *time* have on the tenacity or cohesion of the cement: and hence, we might be led to infer, that, if the antients had any superior skill in this matter, it consisted in their hastening the lime from the kiln to the building.

But, in practice, it is observed, that fresh-made mortar does not *set* so well, does not cohere into a soft stonelike substance, so readily, as that which has been prepared some time before it be used.

This fact, perhaps, is accounted for in the lime having had, under this circumstance,
time

time to lay hold of the particles of *sand*, with which it is intermixed.

But, on the same principle, it seems to follow, that if the preparation be made too long before the mortar be laid into the wall, it will have regained too much of its fixed air, to lay hold, sufficiently, of the *stones*, or other materials, which it is intended to bind together.

Let this be as it may, it is common, in practice, when mortar is not used, presently after making, to cover it up closely from the outward air. It is the opinion of a person, who has paid this subject considerable attention, that, if mortar be buried within the surface of the ground, it may be kept twelve months in perfection.

The same person, whose penetration and judgment, in the few subjects he has more particularly employed his mind upon, are superior to those of most men, has struck out a new idea relative to the *slaking* of lime for mortar.

Lime, whether it be intended for cement or for manure, ought to be reduced entirely to a dry *powder*. And, for cement, it ought to be mixed, in this state, evenly and intimately with the sand.

It

It is difficult, if not utterly impossible, to reduce lime *entirely* to *powder*, with *water* alone; some part or other will always be supersaturated, and thereby be reduced to a *paste*; while the outsides, which are exposed to the atmosphere, will (unless the stone be extremely *fine*) fall in *granules*, not into powder.

Every piece of paste, and every granule, though but the size of a pea or a mustard seed, is useless, if not detrimental to cement; for, with these, the grains of sand cannot be intimately mixed; much less be coated with them; as they may, and undoubtedly ought to be, with *lime in powder*.

But if, instead of water, *wet sand* be used in slaking the lime; (piling it with the lime in knobs, layer for layer, and covering up the heap with it;) those evils are avoided: no part is supersaturated, nor are any granules formed by the action of the outward air.

Besides, another great advantage is obtained by slaking the lime, in this manner, with the sand with which it is intended to be incorporated. The two ingredients, by being, perhaps, repeatedly turned over, and by passing through the sieve together, ne-

cessarily become intimately blended; more intimately, perhaps, than they could be mixed, by any other process, equally simple. If the sand be *washed* (and all sand mixed with lime for cement ought to be washed) the labor of preparation is, by this method of slaking the lime, considerably lessened.

But, in the preparation of cement, SLAKING THE LIME makes only one stage of the process; MIXING THE INGREDIENTS intimately, and uniting them closely together, into one compact homogeneous mass, is an operation which requires the strictest attention.

We have seen the uselessness of unburnt lumps of lime in cement; and the good effect of *puddling* cement has been at least conjectured.

Compactness seems to be essential to the *hardness* of cement. When mortar is laid on with the *trowel*, it remains in the state in which it is laid, and does not run together into a close form, like melted metal or LIQUID CEMENT.

Much care, therefore, is requisite, in the preparation of mortar for the TROWEL. Working it, with the spade alone, is insufficient. Beating it with the edge of a board, a kind
of

of wooden axe, is more efficacious, but is very tedious. MILLS for the grinding of clay are common, and sufficiently effective of the purpose intended : but a mill, for the grinding of mortar, I have not yet seen, nor have I ever heard of such a contrivance.

6. OAK. This is, now, almost wholly laid aside, as a material of the house carpenter ; except for door and window lintels, wall-plates, and some few other purposes, which require strength and durability. The ports of Whitby and Scarborough take off the larger timber ; and the refuse has, of late, been much in demand, for the purpose of inclosure. Deal has of course gained ground, as a building material. There are, however, some few men, who still retain a sufficient partiality for the oak, to use it freely in every species of building, under a full persuasion that, in the end, it will prove the cheapest material.

Having thus enumerated the materials of building, in most common use in the District, I will proceed to give some account of the BUILDINGS themselves ; and of such OPERATIONS, in rural architecture, as merit particular notice.

II. FARMERIES. The spirit of improvement, which has so evidently diffused itself through this extensive county, is in no particular more conspicuous, than in Farm Buildings; nor, perhaps, does any part of it afford so many striking *innovations*, in this particular, as that which is under survey.

The FANCY FARM-HOUSES, which have been erected in different parts of it, I purposely pass over. Taste, whether true or false, mere ornament without use, is foreign to the present subject: and I have, in another work, professedly on the subject of RURAL ORNAMENT, spoken my sentiments freely, on ornamental buildings.

IN RURAL ECONOMY, straight lines and right angles are first principles, which can *seldom* be deviated from, with propriety; either in laying out a farm, or in planning Farm Buildings.

Here, the great object is to obtain the desired conveniences, at the least expence, present and future taken jointly, so long as the given conveniences may be required. To these principles we may venture to add,—the greater number of conveniences there can be included, in one building, the cheaper will those conveniences be obtained.

There

There is a certain width, which can seldom be exceeded, with propriety, in Farm Buildings; but the nearer this width is approached, the greater quantity of convenience will, in general, be obtained with a given expenditure. The long cube form, with the plain span roof, can never be dispensed with, without evident impropriety, in constructing Farm Buildings.

The number of Inclosures which have, of late years, taken place, and the spirit of improvement, which has gone forth upon the Wolds, have given existence to FARMERIES of almost every form and dimension.

The practice of housing cattle in winter, which will be spoken to hereafter, requires a greater quantity of building, than that of wintering them in the open yard. But the quantity of barnroom requisite in this country, even on the arable farms, is much less than in the southern provinces, where barley and oats are harvested loose, and where the shovel, or the sail fan, is used in the dressing of corn. Here, corn is universally bound, and the machine fan in almost universal practice. In Norfolk, *one* man expects a floor of fifteen feet by twentyfour to himself; here, *two* men will thrash, contentedly, on a floor, nine

feet by twelve ; ten by fifteen is a full sized floor.

Such being the requisites of a Yorkshire Farmery, it is no wonder that the new ones, which have been erected, should be composed of a string of small buildings. They are generally formed into a square, open to the south, in imitation of those of other countries, where cattle are wintered in the area between the buildings, not in the buildings themselves.

In one instance, I have observed the cattle hovels spun out, in such a manner, as wholly to inclose the dung yard. But the hovels, in this case, were only seven feet wide ; not wide enough for cattle to stand across them ; they being placed in them, lengthway, in pairs. The quantity of walling, the number of doors, &c. and the quantity of roofing, with the subsequent repairs incident to low straggling buildings, render this, and every other plan which resembles it, altogether ineligible, in any District where cattle are wintered under cover. Wide houses, or open sheds, wide enough to permit cattle to stand across them, are in many respects preferable.

In opposition to the Farm Yard last mentioned, there is, likewise in this neighbourhood, an instance of the entire Farmery (of a small

small upland farm) being comprised under one roof!

The site is a long square. One end is occupied by a small dwelling place for a "hind," or bailiff; the ground floor of the remainder, by a stable and cattle houses; over which are a barn and hay chamber; with a CHAMBER BARN-FLOOR! a thing I had not seen, nor conceived an idea of, before I observed it, in more instances than one, in this District.

This, just noticed, is the only one I have seen, in a *new* erection; I have, however, had full opportunity of observing the use of another, thrown over a cow house, in a large old building, which had long been used as a barn, stable, and beast house.

The advantages of a CHAMBER BARN-FLOOR are dryness, cleanness from dirt carried in with the feet, and security against pigs, poultry, and various accidents, to which ground floors are more liable: for thrashing *wheat* upon, chamber floors are obviously preferable to ground floors; most especially in low dirty situations.

No essential disadvantage has yet struck me, respecting a chamber thrashing-floor; but with respect to a CHAMBER BARN,

there is one which is obvious ; namely, that of having the corn at harvest, a busy season, to raise one story higher than ordinary.

If a barn be built against a rising ground, this objection falls, in part, or wholly. Even on plain ground, it appears to me that (especially where cattle are housed) it would be greatly overbalanced by the advantage of obtaining a suite of stables, cart house, and cattle houses, without the expence of roofing, in the first instance ; and which, if substantially built, would last for ages to come without repairs.

The flooring of a chamber barn might, on the whole, be somewhat more expensive than that of a ground-floor barn ; but the thrashing floors, if of plank, would be laid cheaper, and last much longer, in the former, than in the latter species of building ; and the mow floors, if laid with clay on rods *, would soon regain their extra cost, in keeping the bottoms of the mows dry and sweet ; and in preserving it more secure from vermin, than ground floors generally do.

It is not my intention, even to intimate, that in corn countries, such as Norfolk,
Kent,

* See THE RURAL ECONOMY of NORFOLK, MIN. 15.

Kent, and other Districts, where cattle are wintered in yards, that chamber barns would be universally eligible; but, in a country like this, or in any country, or on any farm, on which grassland predominates, and where the housing of cattle is practised, I see no sufficient objection to chamber barn-floors, nor to entire chamber barns. On the contrary, it appears to me, that, on small grassy farms, in low damp situations at least, they would be found singularly eligible.

But although a close yard is unnecessary, where cattle are housed, a single building, like that which was last described, is perhaps too simple, to be altogether eligible; especially in an exposed situation, where some degrees of shelter are requisite.

Two buildings, properly placed, would give this necessary shelter; one of them a barn, with offices under it; the other, the dwelling house, placed at right angles with the former: the two buildings touching at the corners only; forming two sides of a small yard with their ends, for hogs, poultry, &c. and a larger one with their fronts, for the dungpit, &c. with a small archway communication between them.

This, however, is intended by way of hint.

hint. To enter into the particulars of a plan, which I have not seen executed, would be breaking into the design of the present work: nevertheless, it might be wrong to suppress this idea (which struck me while I was sketching a plan of a Farmery on the above principles) with regard to ASPECT.

It is usual, in planning a farm yard, to place the main line of building with its front to the south; in which case, two wings become necessary to screen the yard from northeast and northwest winds: and perhaps this has established the common practice of inclosing a farm yard, on three sides, with buildings.

But if, instead of the back of a building being placed to the north, the angle of two buildings were directed to that point, the yard would be most effectually screened from the north, the northeast, and the northwest wind, without an unnecessary multiplication of low narrow buildings, to eke out a third side with.

On a capital corn farm, on which a number of substantial buildings are required, three lines of building may be eligible; but on any small farm, or on almost any farm on which grass lands abound, two lines of building, forming a chevron or carpenter's square, and

and placed with the *angle towards the north*, would, in my opinion, be greatly preferable.

Another idea in RURAL ARCHITECTURE, new to me as that of a chamber threshing-floor, I have seen executed, in a substantial manner, by two of the first occupiers in the Vale; namely, A GRANARY OVER A BARN FLOOR.

In all other barns I have seen, the space over the floor, whether this be large or small, and whether the building be low or lofty, remains entirely useless *. The idea of occupying the lower part of this space with a cattle house, as well as that of filling the upper part of it with a granary, have perhaps been originally and recently struck out, in this country †.

In the two instances in which I have seen GRANARIES OVER BARN FLOORS, the joists are supported by two beams, thrown across the building, and the flooring of the granary
let

* Except in one instance, in which a very spacious building having been converted into a barn, joists were thrown across out of the reach of the flail, and the mows continued over the floor.

† Since this was written, I have been informed, that, in some parts of America, chamber barns, over cattle houses, are in common use. 1796.

let into the walls, at the ends ; so that, notwithstanding the granaries may be surrounded with vermin, they are, in a degree, secure from their attack.

In the floor is a trap door, with tackle over it, to raise and lower the corn from and to the barn floor.

The height, between the floors, is thirteen feet. This, in my opinion, is too great a height. Ten feet high is the most the flail requires * ; and every inch above that height renders the granary, in many respects, less commodious.

Confining the dust, which always rises more or less in thrashing, appears to be the only objection to a BARN-FLOOR GRANARY : I mean in a barn with pitching holes to house the corn at. But if VENTILATORS were made, immediately under the granary floor, with valves to open or shut as the wind should change, the health of the thrasher would, in all probability, be less injured, than it generally is, by this laborious and unhealthful employment.

Indeed, in this country, where tall, wide folding BARN DOORS are grown into disuse,
vent

* See NORF. ECON. MUSE. 35.

vent holes of this kind are, in some degree, necessary to every barn floor. Even upon the Wolds, a corn country, the use of large doors is declining: some good barns have lately been built, with common-sized doors; one at each end of the floor: opening, however, in two parts, one above the other; so that the lower half can be shut, to keep out pigs and poultry, while the upper one is opened, to let in light and air.

This is a *fortunate* circumstance for the owners of landed estates: folding doors, large enough to admit a load of corn, are expensive in the first instance, and frequently require repairs; besides the thrashing floor, be it of what material it may, being liable to great injury, in the act of drawing loaded waggons upon it.

Indeed, throughout, the YORKSHIRE BARN is characterized by frugality. In Norfolk, barns of one hundred and fifty to two hundred pounds cost are not unfrequently built: here, a very convenient one, and such a one as will satisfy a good tenant, may be built for forty or fifty pounds. What a saving is this, upon a large estate!

III. The OPERATIONS which require to be noticed are;

1. The

1. The method of laying pantiles.
2. The method of coping ridges and gables.
3. Eaves gutters.
4. Water cisterns.
5. Painting window leads.
6. Mortar floors *.

1. LAYING PANTILES. Formerly, it was the practice to hang pantiles upon the naked spars, bedding their ends in mortar, and pointing them at the sides, to prevent snow and rain from being beaten through, between them.

This method has two evil effects: lime is liable to expand, contract, and perish with the weather; to which, in this case, it is fully exposed. The consequence was, if the cement laid fast hold of the tiles, it broke them; if not, it slid from between them, and left the roof room exposed to the weather. The other bad effect of this method is, their being liable to be thrown off, in high winds, by the inward air being pent up, and finding an easy passage through this slight covering.

To remedy these two evils, it has, of late years, been the common practice to “sheet”
the

* Particulars which are interesting to those, only, who practise in Rural Architecture.

the roof ; that is, to interlath, with plastering laths, between the tiling laths, and to cover the entire roof with a sheet of lime mortar : and over this, to lay the tiles on “ dry ;” that is, without bedding or pointing them ; being careful not to suffer any part of them to touch the mortar :—to prevent which, the most effectually, a slip was nailed on, between the spars and the tiling laths, to raise the tiles sufficiently above the sheeting.

This method, which has been practised some fifteen or twenty years, has been found effectual, against the two inconveniences above mentioned ; but it has lately been found, that, in twelve or fifteen years, the laths begin to fail ; owing, it is supposed, to their being placed too near the outward air ; from which the lime alternately absorbing and imparting moisture, the laths become subjected to decay. I am rather of opinion, however, that this effect is caused by the tiling laths, checking the descent of the rain or snow water, which beats in between the tiles. Or it may be owing jointly to the two causes.

Be this as it may, an improvement has lately been struck out, which brings the art to as great perfection, perhaps, as it is capable of.

of. This improvement consists in nailing the plastering laths *beneath*, instead of *upon* the spars ; laying the main coat of plastering *above* the laths, between the spars ; afterwards, smoothing the under side with a thinner coat. This method removes the cement from the more immediate action of the atmosphere, gives a free circulation to the air and the water (which may be beaten in) between the tiles and the plastering ; and, at the same time, gives neatness to the room beneath ; without the expence, or the inconveniency, of a counter ceiling.

There is one very great conveniency arises from laying on pantiles dry. If, by the wind, or by accident, a tile be thrown off or broken, it may be replaced by a plowman, as well as by a professed tiler : a conveniency, which upon a farm, perhaps at a distance from workmen, is of no small value.

2. COPINGS. *Ridge Tiles*, being laid entirely on mortar, and being exposed in the fullest manner to the action of the winds, are very liable to be thrown off ; as well as to be broken by the weather : it is no uncommon thing, in places where ridge tiles are used, to see half of them displaced or broken ; the heads of the spars having
nothing

nothing but the mortar to hide them, without any thing to defend them from the weather. The ill consequence is evident.

In this country, where freestone which will stand the weather abounds, RIDGE STONES are in common use.

The form triangular ; the half of a long square, divided diagonally. The base or broadest side is hollowed, to receive the top of the tiles : the opposite angle forms the ridge. The angles of the base are generally dressed off, to prevent the wind from laying hold of them ; and to give them a more snug and neat appearance. They are set on with mortar, in the same manner as ridge tiles are laid.

The *coping of gables*, let the walling material be what it may, is usually of dressed stone, supported, at the foot, by an ornamental bracket of the same ; projecting ten or twelve inches without the side walls ; giving a degree of lightness, and an appearance of consequence, to the building.

The end of the first stone of the coping rests on this corner bracket ; the others, respectively, on those next below them.

There is an evil effect attends the common method of putting on these copings : the ends

of the stones being usually cut square, and laid flush with each other, to prevent their slipping, and to give them a smooth uniform appearance, the joints between them, when the mortar begins to fail, receive rain water, and conduct it into the end wall; by which means their principal intention, the preservation of the wall, is rendered defective.

To prevent this effect, I have observed, in a few instances, an ingenious expedient practised. The upper ends of the coping stones are pared down, to about half their common thickness (as from two inches thick to one), with a slope, sufficient to give descent to water, when they are laid upon the gable: and the lower ends have notches cut on their under sides, to receive the reduced points of the upper ends, about an inch beneath them.

By this expedient, the water is effectually got rid of, without endangering the firmness of the coping; but simplicity being, by this means, disturbed, the eye is displeased, with what however is, upon the whole, a very valuable improvement*.

OR

* Perhaps, giving the upper ends of the stones, a wedge-like form, and cutting bird's mouths in their lower ends, to receive the points, would be an improvement.

On *this* side of the Vale, the Morelands afford, in great abundance, stones well suited to these purposes : but, on the Malton side of the District, freestone is less abundant : nevertheless, such is the conveniency of inland navigation, the Derwent brings a supply of those useful materials; ready dressed, and fitted for use. And now; when inland navigations are become so prevalent, there is scarcely a district in the kingdom, which might not be supplied with them, from one place or other, at a moderate expence *.

3. EAVES GUTTERS. The troughlets made use of to catch rain water, dripping off the eaves of roofs, are usually formed by nailing two narrow slips of board together : but eaves troughs; made in that manner, are liable to warp, and become leaky at the joint ; —the bottom ; —the most essential part.

Here, they are pretty universally hollowed out of *a triangular piece of wood*, —with a round-mouthed adze. A piece, six to eight inches square, slit diagonally, affords two

K 2

triangular

* The price of the stones; which are raised near Leeds, and carried, by water, down the Aire, and up the Derwent, to Malton, are as follow: *Ridge stones* fifteen pence a yard, or five pence a foot: *Copings* the same price: *Brackets* two shillings and sixpence each.

triangular pieces fit for this purpose. The hollowing is not a work of so much labor as theory may suggest. They are usually made of deal. Gutters thus made are stiffer, and more easily supported,—are less liable to warp, and much less subject to leak,—than those made in the usual manner.

4. WATER CISTERNS. In Surrey and Kent, there are instances of wells, three hundred feet deep. The expence of tackle, and the expence of labor, in raising water, for every domestic purpose, and frequently for the use of stock, from this intolerable depth, would, it is natural to imagine, have long ago driven the inhabitants to some expedient, for collecting rain water: yet still they draw water out of the bowels of the earth; or, in very dry seasons, drag it perhaps three or four miles, uphill, in water carts!

In the island of Bermudas, and in some of the West India islands, the inhabitants have (generally speaking) no other fresh water, than that which they collect from the atmosphere, in tanks; and it is striking to see the small quantity of collecting surface, requisite to the supply of a family, with this necessary element; a surface which is small, in comparison

parison with the roofs of a middle-sized farm house and offices.

In this District, in which water cisterns are growing into general use, especially in upland situations, I have seen an instance where the dwelling house, alone, affords more than a sufficiency of water, for every use of the family. Nor is it the conveniency of having a constant supply of water, always at hand, which alone constitutes the utility of water cisterns. Rain water, preserved in quantity under ground, is pure and palatable in a superior degree : cool in summer, and warm in winter. It is particularly grateful to cattle ; especially when they are ill : and it is highly probable that, as a menstruum of aliment in general, it is the most *wholesome* water.

The *situation* of a water cistern is generally under the kitchen, or in a vacant corner of the yard, near the kitchen door.

The *forms* of water cisterns are various. The deeper they are sunk, the better they keep the water. The cube is perhaps the most convenient figure ; but a double cube would perhaps keep water better. A cistern nine feet cubical would contain twenty-

seven cubical yards, or about ninety wine hogsheads of water.

The *materials* of water cisterns, in this District, are clay, bricks, and tarras.

The *method of making* has lately received a considerable improvement. When the art was less known, than it is at present, an irregular hole was dug; the determinate figure of the cistern being given by the walls; behind which the clay was *rammed*. Now, the intended form of the cistern when finished, is given to the excavation; whose sides are squared and plummed, with the exactness with which a wall is carried up. On this wall-like face of the excavation, the clay is laid *plaster-wise* with a trowel, coat over coat, two or three inches thick; and against this firm even face of plastering, the brick work is raised. The bottom is, or ought to be in all cases, bedded with three or four inches thick of strong clay, beaten into a smooth even waxlike substance. On this flooring of clay, a double floor of brick is laid; and, on the margin of this, the side walls are carried up, half a brick thick. The bricks are, I believe, invariably laid in tarras.

The *covering* is similar to that of a well; with a pump, or a roller and bucket. The latter,

latter, perhaps, the more eligible ; especially if the admission pipe were carried down to near the bottom of the cistern ; by which means the water, at the surface, would always remain undisturbed and pure.

5. PAINTING WINDOW LEADS. This is not introduced as a thing of importance : but the practice seems to be peculiar to this country. It gives a degree of neatness pleasing to the eye ; and the paint is said to be a preserver of the lead. The color invariably white.

6. MORTAR FLOORS. A new species of cottage flooring has lately been thought of, and is now pretty commonly formed, in this neighbourhood.

The *materials* are lime and sand ; mixed in nearly the same proportion, and prepared in the same manner, as the common mortar of bricklayers ; except, that for forming floors with, it is generally made stronger, and is always made up softer, than it is usually done, for laying bricks in.

The *method*. The bed being prepared, the materials are carried on, in pails, in a state between paste and batter ; laying them on four or five inches thick, and about one inch higher than the intended height of the

floor ; to allow for the settling, in drying. The whole being well worked over with a spade, the surface is smoothed with a trowel ; and, as it dries, is beaten, repeatedly, with a flat beater, to prevent its cracking ; the workman, in this operation, standing on planks.

A fortnight or three weeks of dry weather will render it stiff enough to walk upon.

If, after the last beating, cross lines be deeply graven on the surface, a floor of cement has the appearance, as well as the usefulness of a freestone floor.

3.

DRINKING PLACES.

IN DISTRICTS abounding with upland grass, we may expect to find ARTIFICIAL DRINKING PLACES for the use of pasturing stock. But no District in the kingdom will gratify our expectations so fully, in this respect, as that which is now under observation.

In

In this country, there are three species of artificial watering places :

1. Made Pools.
2. Made Rills.
3. Field Wells.

I. MADE POOLS. The art of “pond-making” ranks among the most useful arts in Rural Economics. In many high situations, no other expedient can be practised, with propriety: rills cannot be raised, nor wells sunk and worked, but at too great an expence, for the purpose of watering stock.

On the hills of Surrey and Kent, ponds are made to hold water, tolerably well, with *chalk*, beaten firmly together *: and in Norfolk, I apprehend, they have been formerly made with *marl*. In all countries where unfathomed beds of *clay* are common, drinking pools sufficiently retentive may, at a small expence, and without much art, be formed; and are, in general, sufficiently abundant.

But the art of making retentive pools, with CLAY, in *loose absorbent soils*, is a recent discovery,

* Experiments have, it is said, been tried with chalk, upon the Yorkshire Wolds, without success; owing, probably, to the too great hardness of the Wold-chalk. A ductile soft chalk is fittest for this purpose.

discovery, which has been hit upon in this District ; in which it has made a rapid progress, and is now in universal practice, among farmers of every class. Indeed, for a country like this, where upland soil is kept principally in grass, it may well be considered as the most valuable discovery which has lately been made in Rural Economy *.

There is little difficulty in making a pit hold water, with clay alone ; provided it be kept up full to the brim ; but once emptied, its retentiveness is lost. There are two causes of this loss of retentiveness :—the cracking of the clay by *drought* ; and its being liable, whenever the water subsides, and even perhaps when filled, to be perforated by *worms* ; which convert the basin into a filter, and for ever destroy its retentiveness. It is therefore necessary, that those two enemies should be guarded against.

To guard against the latter, a coat of LIME is spread, under the clay : above it, a coat of
EARTH,

* FRANCIS and ROBERT GARDINER, well-diggers and fish-pond makers, of Driffeld, are entitled to much more than the *credit* of this discovery. The York Agriculture Society voted them a premium of ten pounds : were the Nation to grant them ten thousand, it would not be more than they merit.

EARTH ; and, over all, a covering of STONES is laid ; for the double purpose of guarding against drought, and for preventing the feet of cattle from injuring the CLAY ; which alone is the cause of retentiveness ; and on the proper ordering of which the art principally depends.

But many other particulars are requisite to be known, before the art can be sufficiently understood, to be practised with certainty.

1. The Run, or collecting surface.
2. The Reservoir.
3. Liming.
4. Claying.
5. Covering.
6. Time of making.
7. Cost.

1. THE RUN. A bare firm surface, as a *road*, collects the greatest quantity of water. A *grassy surface* retains the rain water which falls upon it, and which, in *level* situations, is conducted into the soil, by wormholes and other inlets, with which grassland generally abounds ; especially in summer, when a collection is of the greatest value. However, if the subsoil be retentive, *ditches*, especially of arable inclosures, will frequently afford a supply, even in summer ; but, in an UPLAND

SITU-

SITUATION, where the subsoil is generally absorbent, a *road*, or an *artificial run*, becomes necessary.

In upland Districts, as the Wolds of Yorkshire, and the Downs of Surrey and Kent, the surface is generally broken into hill and dale, and diversified by smaller vallies and inequalities. In situations of this kind, ARTIFICIAL RUNS are most wanted, and may be most easily made. I have seen some faint attempts at making them, on the Wolds of this District, by cutting a few grips, with a spade, above the reservoir; but they were too few, too short, and too seldom scoured, to answer, in any considerable degree, the intended purpose. They, nevertheless, shewed plainly enough, the utility of channels for catching hasty showers, falling on *grassy slopes*, off which a considerable quantity of water will escape, provided there be channels, at proper distances, to receive it.

To reap the greatest benefit from an artificial run, and to make it with the greatest ease,—form the basin at some considerable distance from the head of a valley; from which, down to the reservoir, open a main channel, by two furrows of a plow, turned outward. From this main stem, plow lateral branches,

branches, with an easy descent towards it, along the sides of the slopes, by single furrows, turned downhill; by which means the plowing will be rendered easy, the channels made free on the upper sides for the admission of water, and high on the lower sides for retaining it.

The plow would not be less expeditious, in scouring, than in making the channels: or, perhaps, a more sledge-like implement would be still more effectual, than the plow, in closing the fissures and wormholes, which presently are formed in watercourses laid dry; and which, if left open, absorb an inconceivable quantity of water, before they be saturated; especially if the current of water be retarded, by grass, or other obstructions.

2. THE RESERVOIR. The *situation* of the reservoir depends principally on the run. Near the side of a road is, in general, the most desirable situation; provided a sufficient descent can be had, from the road to the reservoir. Roads leading along the sides of slopes can only afford a supply to the grounds on their lower sides. But, in this country, when a road leads down the descent, it is generally furnished, on both sides, with ponds; some of them, perhaps, not having more than
a hundred

a hundred yards of run, off a narrow road way; yet, from that small quantity of surface, are sufficiently supplied with water.

In the *situation* of a pond, there is one thing requisite, which does not seem to be attended to, even by the most skilful in the art. The requisite I speak of is that of admitting a waste-water place, on the upper side of the reservoir, to prevent the water, when the pond is full, from running *through* it; by which means it becomes filted up, unnecessarily. For the nature of foul water is such, that, whenever it changes from a current to a stagnant state, it deposite a considerable part of its foulness; so that the water, which leaves a full reservoir, is finer, than that which enters it; the sediment of course being left behind in the reservoir. Whereas, if the current into the pond were to cease when the pond is sufficiently filled, the sediment of the overplus water would be got rid of. The pond would receive, in this case, no other foulness, than that which was given by the quantity of water, requisite to fill it *.

The

* A small CATCH POOL, between the run and the reservoir, would arrest much of the foulness of water, collected from a road; and, in a situation which could admit
of

The form of the reservoir is, universally, that of a shallow basin, or more strictly speaking, that of a flat cone inverted; the sides shelving straight from the brim to an angle or point, in the center. If the excavation be made sixty feet diameter, its greatest depth is about seven feet: if forty feet diameter, the depth is about five,—before the coats of clay, &c. be laid on *.

The first business, in *setting out* a reservoir, is to take the level of the site, and drive piles, as a guide in forming the banks, and in making the conducting channel, and waste-water place.

If the situation be on a *slope*, the excavated mold is used in forming the bank, on the lower side: if nearly *level*, the mold requires to be removed, or (if laid round the edge) the conducting channel to be raised.

If

of it, would be worth the trouble of forming. In many situations, the mud it might collect, would amply repay the expence of forming it.

* A reservoir set out twentytwo yards diameter, by seven feet deep, will, when finished, measure about sixty feet by six, and will hold about two hundred and ten cubical yards, or near seven hundred hogshheads of water. Forty feet diameter by four feet deep, when finished, contains sixtytwo cubical yards, or two hundred hogshheads (of sixty-three gallons, wine measure).

If clay or stone be excavated, it is laid separately aside, to save carriage.

If the lower side be raised with the excavated materials, they ought to be firmly worked together, or should lie a sufficient time to settle; otherwise, the side, thus formed, is liable to settle, after the reservoir be finished; by which means cracks are formed, and a miscarriage ensues.

The excavation having received the intended form, its sides are made firm and smooth, for the reception of the lime.

3. LIMING. The use of lime being merely that of preventing earth worms from perforating the coat of clay, the proper *quantity* depends, in some measure, on the nature of the soil. A fat rich earth, among which worms always abound, requires more than a dead hungry mold, or a dry stoney bottom; on which retentive pools are said to have been made, without lime. However, as no soil, perhaps, is entirely free from those enemies to ponds, it would be folly to risque a miscarriage, in any situation; as the expence of lining makes but a small portion of the whole expence.

The only *preparation* of the lime is that of slaking it, and picking out the cores; no
lifting

sifting or skreening being, in general, used; though obviously useful.

It is usually *laid on* with a spade or shovel; but a sieve would, perhaps, be found, by the inexperienced, a better tool; and the extra labor no object.

The *thickness of the coat*; laid on, is about half an inch. Half a chaldron of lime is sufficient to complete a pond of forty feet diameter. The principal part of it is laid on, beneath the clay; a few bushels, only, being reserved for scattering round the edges, to prevent the worms from getting *into* the clay *.

VOL. I.

L

4. CLAY-

* A still more secure, and, on the whole, a more eligible method of liming has lately been thought of, and is now (June 1787) in practice, at Lockton (in this neighbourhood) by the Commissioners of Inclosure, in making PUBLIC DRINKING POOLS, for the use of the township. Instead of scattering the lime, in powder, it is formed, with sand, into mortar; a regular coat of which is spread, about an inch thick, not only beneath, and at the edges of the clay, but over the entire surface. This is an obvious improvement, which appears, to human foresight, to bring this method of forming pools near to perfection. The clay becomes cased, on either side, with a regular coat of cement, and is thereby secured, in perhaps the completest manner possible, from the attack of worms. The labor and expence, however, is by this method increased. A pond, nineteen feet diameter, took two chaldrons and a half

4. CLAYING. In this operation, the manual art, and the labor, principally center.

Upon the Wolds, clay is sometimes fetched six or seven miles; and is seldom found at hand, in situations where artificial pools are most wanted: the *carriage* of the clay, therefore, generally becomes a heavy article of expence.

The *choice* of clay is thought to be less essential, than the working of it. Good ponds are said to have been made with common loamy mold; but it is wrong to depend on any thing, but a strong ductile clay, if it can be had, within a moderate distance.

The *thickness of the coat*, now pretty generally laid on, is about five or six inches, in the rough; beating it down to about three inches. In the infancy of the art, two coats of clay, of about that thickness, were laid on; but one coat has been found effectual, and much less expensive. However, it is probable, it will not prove so durable.

The

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half of lime, and five small cart loads of sand. Both the materials were sifted, and worked up, in the usual way, into mortar. Great caution is necessary in laying on the clay, in this case. If the mortar do not lie some time to stiffen, the clay displaces it: if it get too dry before it be covered, it is liable to crack.

The *method of beating* will be difficult to describe; yet it most especially requires description.

The *drier* the clay is worked, the less liable it will be to crack with drought, when finished. In a dry season, however, it is necessary to moisten it: for which purpose the center of the pit is sometimes finished, first, to collect the water of showers; the carriage of water being, in some cases, expensive.

In *laying on* the clay, the workmen begin at the bottom of the pit, and work upward; laying patch after patch, or circle after circle, until the brim be reached; taking great care not to carry on sticks, straws, dirt, or any kind of foulness, among the clay, or with their feet; and being careful not to displace the lime, in throwing it on: to prevent which the lime is not spread over the whole, at once; but is scattered on, as it is wanted to be covered with the clay.

A plot of clay laid on, and adjusted, it is *beaten* flat, with a wooden "mell," or beetle, made, at present, of these dimensions: the head fourteen inches long, and three inches diameter; the handle four feet long, and suited in thickness to the hand of the work-

man. Beetles of different sizes have been in use, in different stages of the art ; but none of them have been found to be so well adapted to the operation, as that in use at present.

The first operation is performed with the *side* of the beetle, to level the protuberances, and smooth the roughnesses, so as to make the whole into a regular sheet of an even thickness.

This effected, it is struck, forcibly, with the *end* of the beetle, which is driven down nearly, but not quite, to the lime ; leaving the surface full of somewhat honey-comb-like cells or dints. If the beetle be struck, unguardedly, quite through to the lime, a piece of clay, and a little lime, if required, is carefully placed in the breach, to prevent a defect, in the part thus injured.

The whole being gone over, in this manner, with the *end*, the surface is again levelled down, with the *side*, of the tool ; the workman walking backward.

The next beating is with the *end*, but not quite so deep as before ; and the roughnesses being again levelled with the *side*, it is again worked over with the *end* ; but still shallower than in the middle beating.

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The first strokes with the *end* of the beetle ought to close the bottom of the clay, firmly, with the lime and the bed on which it is spread ;—the second ought to unite the middle of the clay with the bottom ;—and the last to close, without a pore, the upper part with the middle ;—and the last strokes, with the *side* of the beetle, ought to be sufficiently forcible to close, entirely, the dimples formed by the last-given strokes with the end.

If these several operations be thought insufficient, it is continued to be worked with the end and side of the beetle, alternately, until not a flaw can be found ; the entire coat of clay being manufactured into a lead-like sheet, firm enough to bear a man without an impression, and a horse without injury *.

5. COVERING. The first coat is of common *earth*, to assist in keeping out the drought, and to make a bed for the stones ; to prevent their asperities from piercing, and

L 3

thereby

* When two coats of clay were in use, the upper one was laid upon the rough surface of the last end-beating ; by which means the two coats became, by the subsequent beatings, incorporated in one thick sheet. A substantial method, this, of which the present appears to be rather a refinement, than an improvement.

thereby injuring, the sheet of clay. This coat may be three or four inches thick, according to the nature of the stones with which it is to be covered. If these be large and irregular, more earth is requisite, than when the stones are small, smooth, or flat. The leanest most infertile soil is fittest for this purpose. WORMS and WEEDS are equally to be feared; and a rich soil is genial to both. In this point of view, two coats of clay are much preferable to a coat of clay, and a coat of rich mold.

Pondmakers seem not to be sufficiently aware of the mischievousness of WEEDS: indeed, some ponds will remain, for several years, in a manner free from them. But I have seen others, in which weeds, even docks (near the edge) have grown luxuriantly. It is probable that the tap-rooted weeds strike through the several coats; and, whenever the roots decay, a perforation must be left.

Mold taken from a dry sound highland situation is, in all human probability, less liable to propagate *aquatic* weeds, than the earth of a low situation or a bog*.

The

* I have observed an ingenious and simple method of keeping the weeds under; especially at the edges, where they

The mold being rendered level and smooth, the *stones* are laid on : first covering the mold with the largest, laid with a flat side downward, to prevent their sinking down to the clay ; and upon these laying smaller, until the coat be made five or six inches thick *.

A PAVEMENT would be a more regular covering ; and, if the stones were set in lime and sand, would not only prevent *worms* from getting into the mold, and upper side of the clay, when the pond happened to be dry ; but would, in all probability, prevent *weeds* ; and, when the pond required to be *cleaned* from mud, would be a regular floor to work upon.

The only objection I have heard made to PAVING the bottoms of ponds, is, that it would be a temptation to cattle to go into

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they are generally most abundant. Though all the sides of a drinking pool be open, cattle will go to particular places to drink ; and, in these places, the weeds are trampled upon and killed. Therefore, to check the rankest, the parts which are most free are covered with thorns, while those which are weedy are left open, for the cattle to drink at.

* *Straw* has been used between the clay and the stones ; and, in the instance (mentioned in a foregoing note) in which an improved method of liming was practised, a layer of thick *sed's* was laid, grass-side downward, upon the lime ; and, upon the *sed's*, about six inches thick of loose stones.

the water, in hot weather ; and, by standing there, would not only foul the water, but in time tread up the pavement, and injure the clay ; whereas sharp loose stones prevent their going farther than the edge. If the stones made use of in a pavement were sufficiently large, the latter part of the objection would fall ; and whether cattle standing in a pool, in summer, be detrimental or beneficial, may be a disputable point.

However, whether or not the inside of the basin ought to be paved, the rim should certainly be a broad smooth causeway, with a gentle grassy slope from it ; especially on the lower side ; that the cattle may approach the water, without wading in dirt, to the injury of the bank ; and without having sharp loose stones to walk and stand on, while drinking.

A drinking pool, formed by a skilful artist, full to the brim, free from weeds, and smooth round the edge, is, in a green pasture ground, as agreeable an object, as the eye can be entertained with.

6. SEASON OF MAKING. Autumn is esteemed the best time. Drought and frost are both enemies to new-made ponds. In autumn, drought has generally abated, and a
sufficiency

sufficiency of rain water may be expected in this season, to fill them before frosts set in. A covering of *straw* over the stones is the usual guard against the extremities of seasons.

If a reservoir be formed in a slope, where the lower side requires to be raised with loose earth, it ought (as has been already intimated) to remain a considerable time to settle, before the coatings be put on: otherwise, it is liable to settle afterwards, and crack the clay. I have seen an instance of miscarriage through this neglect. If there be much made earth requisite to be raised, the excavation ought to be formed, twelve months before the claying be done.

7. EXPENCE. Although it is now twenty years since the discovery was made, the art is still partially hid under the veil of mystery; and is not yet become familiar to common farm laborers. In *this* neighbourhood, ponds still continue to be made, by men from the Wolds; all of them, in reality or pretence, pupils of the first inventors.

These men generally work by the gross; the price being in proportion to the diameter: but they seem to have no regular method of calculation.

Ten pounds were given, and may now be considered as a medium price, for twenty yards diameter *; forming, claying, covering, and, generally, digging the clay, included: all carriage and extra labor being done by the employer.

A circle twenty yards in diameter contains in its area 314 square yards. Therefore, each square yard of *surface* costs, at this price, sevenpencehalfpenny.

The solid contents of a cone, whose base is 60 feet diameter, and whose height is six feet, is 209.4 cubical yards; each of which costs, in the above instance, elevenpence-halfpenny.

Five pounds have been given for a pond, twelve yards in diameter: which is tenpence-halfpenny, each square yard of surface; and, supposing it four feet deep, two shillings each cubical yard of water.

Three guineas were given for forty feet diameter, and four feet deep, the excavation having been previously formed. This may be called four pounds for the gross; which
is

* In the early days of the art, and when two coats of clay were used, twenty pounds were given for ponds of this dimension.

is about sevenpence a square yard of surface; or fifteenpencehalfpenny, each cubical yard of water.

The men, in the last case, earned about three shillings and sixpence a day, without extraordinary exertion. In the first mentioned instance, the same workmen did not (according to their own assertion) make more than two shillings and sixpence, a day. But a large pond gives longer employment; and the business of pondmaking being uncertain and inconstant, travelling workmen can afford to make a large pond at a cheaper rate, than a small one.

The *curve superficies*, or superficial contents of the *sides*, of a cone twenty yards in diameter at the base, and two yards high, is about 320 square yards. This, in making a pond of those dimensions, is *the quantity of coating*: for each yard of which near $7\frac{1}{2}d.$ was given in the first instance, and less than $7d.$ in the last. *Sixpence each square yard of surface to be coated, may perhaps be taken as a fair medium price.*

To ascertain the quantity of coating, *to be done*, measure the exact circumference or rim of the pit, when finally formed and adjusted for claying: this dimension multiplied by half
the

the length (or depth) of the side (measuring from the brink, down the slope, to the center) is the quantity of surface *to be* clayed and coated. The digging would (under this mode of calculation) fall proportionally heavier, on a large pond, than on a small one ; but this would be counterbalanced by the advantage abovementioned.

The quantity of clay used, in the first instance, was about forty cart loads, fetched about three miles ; in the last, about fifteen loads, fetched one mile. The quantity of lime, in the former case, one chaldron ; in the latter, half a chaldron.

From the sum of these particulars, it is plain, that the larger the pond, the less, in proportion, is the expence. A reservoir, to contain two hundred cubical yards of water, requires little more than three hundred square yards of coating ; whereas one, to contain only fifty yards of water, would require one hundred and twenty yards of coating : consequently, a cubical yard, of the former, would only cost (at ninepence a yard for manual labor, materials, and carriage) eighteenpence ; while the same quantity, of the latter, would cost near two shillings and sixpence.

The utility of Drinking Pools requires

not

not to be dwelt on : but the SUPERIORITY of pools, made in the manner above described, to those which have formerly been made, by some other art, or which have been formed by nature or accident, may with propriety be mentioned. During the dry seasons which have prevailed of late years, it has been observed, that newly made ponds retain a supply of water, when the waters of other stagnant drinking places are dried up. This can only be accounted for, perhaps, by their perfect retentiveness, and by their being free from weeds, which convert to their own nourishment, and throw off daily by perspiration, a great quantity of water. Upon the Wolds their excellence was most conspicuous :— while one man was driving his stock, three or four miles to water, his neighbours, who had “made ponds” upon their farms, were free from this serious inconveniency. In many situations, artificial Drinking Pools may repay the expence of making, the first dry season. Driving stock to distant water, in hot weather, and in a busy season, is an expence, and a detriment to the stock so driven, which it would be difficult to estimate.

GENERAL OBSERVATIONS. — On examining ponds, in this neighbourhood, which
have

have been made some years, the evil effect of *covering with loose stones* is evident.

For one, two, three, or more yards round their edges, according to the time they have been made, the use they have been liable to, and to the steepness of their sides,—the stones are entirely displaced, or trodden into the clay; which is, by this means, exposed to the feet of cattle, and to the open attack of drought and worms. For a while, the clay; even thus exposed, preserves its retentiveness; but, in time, it is destroyed, and the most valuable part of the pond entirely lost.

This effect is so *probable*, so evident to be foreseen, that, on first reflection, it seems astonishing so unsuitable a covering should be universally adopted. A cattle, when it goes into a drinking pit, necessarily throws the chief part of its weight upon its fore feet; which, in the act of drinking most especially, are placed, as for the intention of forcing, whatever they stand on, down the slope, toward the bottom of the pit. Upon loose stones, laid on a steep surface, cattle cannot make a step, or move a foot, without producing this effect, in a greater or less degree; and, by repetition and length of time, the entire coat (except some few which happen

to be trodden into the clay) must, in the nature of things, be forced into the center.

But this practice, evidently absurd as it undoubtedly is, in *this* District, was first established upon the *Wolds*, whose *stone* is of a perishable nature; a species of *chalk*; which, on being exposed to air and water, and to the treading of cattle, unites into a cement; which, forming a regular casing, preserves the clay from injury, for a considerable length of time. *Loose chalk* as a covering was, therefore, a good thought of the first inventors (indeed upon the *Wolds* there was no alternative); and it is not to be wondered at, that their pupils, mostly day laborers, should imitate the practice, in this country, by making use of *loose stones*.

Perishable or *soft stones* of any species, a strong rough *gravel*, or even *sand*, would, I believe, be better than loose hard unperishable stones.

But, in this neighbourhood, where stones of various kinds abound; or, in any country, where stones of a proper size can be procured, at a moderate expence; there appears, to me, to be no choice, with respect to covering. A regular FIRM PAVEMENT, strong enough to bear stock without an impression,
would

would last through ages ; and although the expence, in the first instance, would be something more than that of loose stones, its durability would, in the end, doubly repay it. Even the Wold ponds, which have been made, fifteen or twenty years, are many of them beginning to fail, and will, in a few years more, require to be fresh coated : whereas, a pond properly paved would, in all human probability, remain perfect, for at least a century.

There would be an advantage of a PAVED pond, which may not strike every one. The clay and its coverings, while the pond is filled with *air*, appear to be a firm solid mass, which would require a great power to disturb it. But the pond being filled with *water*, the texture of the clay is changed, and the relative gravity of all the covering materials considerably altered. They no longer adhere to the bottom with the same firmness, nor, in fact, lie upon it with the same weight, they did before the water was let in. For if, instead of stone, the clay had been covered with blocks of wood (for instance), whose specific gravity was less than that of water, they would have risen to the surface, and have left the clay wholly exposed : even
stones

stones themselves lie, in water, with little more than half their weight, in air:

This propensity in the covering materials, when covered with water, to rise towards the surface, and the state of softness which the clay is reduced to, by a free communication with the water, render them very liable to be disturbed by the feet of cattle; while subterraneous water; after heavy rains, may insinuate itself beneath the clay, and not only disturb the lime, but raise up the clay, and assist in rendering the coatings still less firm; or, in other words, in promoting the general tendency of the whole, to form an artificial quicksand, or quagmire.

But if a pond were properly PAVED, while the coats were yet in a firm solid state, the pavement, being an inverted dome, and acting as an *arch* against their upward tendency, would preserve them, in that state, so long as the arch itself should remain perfect; which would, of necessity, be until the stones were worn out, or the foundation on which they rested should give way. For the pressure of the feet of the cattle being directed towards the center, would rather *stiffen* than weaken the *arch* *; while the swelling

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* Hence, the steeper the sides of the Pool, the *stronger* the pavement.

of the clay and the soil (if any), with the water which would of course filter through the pavement, would assist in promoting the general union.

If irregular rough pebbles were used, the flattest ends should be placed downward, to prevent their injuring the clay, and the points upward, to prevent the cattle from sliding into the pond while drinking; as well as to prevent their standing upon them, after their thirst were quenched.

But stones hammered into a long-cubical form, like the Scotch stones now used in paving the streets of London, would make the firmest pavement; their upper edges or ends being left rough, for the purposes last mentioned.

It appears to me, that a well made pond, paved in the workmanlike manner, in which the streets of the metropolis are now in general paved, must of necessity remain perfect, until an eruption of the earth, or a general dissolution take place: provided the rim were, from time to time, repaired, to prevent the feet of cattle from breaking up the edge of the basin.

II. MADE RILLS. The heights of the northern margin have neither springs nor rivulets (some very few instances excepted),

nor

nor any other *natural* waters, than the brooks which wind at the bottoms of the deep vallies, that divide them; and the rivulets which generally run at the feet of the precipices, that terminate them.

Formerly, these brooks and rivulets were the only resources which the villages, that are scattered on these heights, had for water, both for the use of cattle, and for domestic purposes.

In process of time, wells were sunk; but they are of such a depth, as to make the labor of raising the water, little less than that of fetching it, from a moderate distance.

This kind of natural necessity has led to an expedient, which, though not new in principle, is perhaps entirely so in simplicity of execution, and might be practised with great advantage, in many similar situations*.

The moreland mountains rise generally with an easy ascent, from the beds of the rivulets last mentioned, to a height much exceeding that of the hills to be watered; and frequently abound with springs, almost to their highest swells.

M 2

These

* 1796. This was written, before I had seen the "potwater leats" of Devonshire. See WEST OF ENGLAND, art. FARMERIES.

These springs are collected, and conducted by a narrow channel, down the slope of the mountain sides, and along the face of the precipice, until the summit be gained; the waters being thence conveyed to the place or places desired.

In PLANNING an artificial rill, a level, and some little knowledge of the country, are the requisite guides. The surveyor begins at the place to which water is required to be brought; and ascertains the lowest part of the brink of the precipice, from which water can be conducted. The face of the precipice is traced in like manner; and, if necessary, the ascent of the moreland hills; until springs, or their natural rills, can be commanded.

If his level bring him to the bottom of the steep, soon enough to catch the rivulet which runs at its foot, the work is readily completed. If not, he goes above its highest bend; generally to the head or highest part of the valley (between the heights and the morelands) and winds along the side of the opposite swell, to some more elevated source.

If, when he arrive on the moreland hills (or by an observation from the top of the precipice) he find that nature does not furnish the
the

the requisite quantity of water, high enough to give the necessary fall, the intention is of course frustrated.

IN EXECUTING an artificial rill, opening a shallow channel, of a width proportioned to the quantity of water to be conducted, is the principal operation. In making *stagnant pools*, we have found, that much art is necessary to make them retentive; but, in forming the bed of a rill, no such art is requisite. It is the nature of *running waters* to render the surface, on which they run, firm and retentive. *Sand* is, I believe, the chief material used in forming the channels of these rills; and this only in places, where an open rock, or other porous stratum, is crossed.

Much, however, depends on the quantity of *fall*, and the quantity of water. If the fall be but little, and the quantity of water, at the source, be such as not to admit of much waste, great care is requisite, in forming the bed of the rill.

The FALL is regulated, in a great degree, by the quality of the *ground*. On good ground, the channel is nearly level. Over faulty ground, the water runs with a current; for the double purpose of getting quickly

over it, and rendering its channel the more retentive.

The principal ENEMIES of artificial rills are leaves, in autumn, and snows, in winter. To remove the obstructions, which these not unfrequently cause, and to repair such breaches, as time will always make in the works of art, a *superintendant* is necessary to every artificial rill.

THE RILL OF KIRBYMOORSIDE is, I believe, the largest, and was the first, which was brought upon these Heights*. Since the introduction of this, several others have been raised; and some few unsuccessful attempts have been made: the channel was, in one instance (that of *Newton*) extended a considerable way before the impracticability of completing it, at a moderate expence, was discovered; a piece of misconduct which nothing but a want of accuracy, in the use of the level, can lead to†.

The

* This rill was brought to the villages of Gillimore and Fadmore, near forty years ago; and has been extended to Kirby, about thirty years,—by JOSEPH FORD; a self-taught engineer, of great ingenuity and some judgment; a man to whom the country owes much.

† The miscarriage, in this case, was not owing to a want of elevation in the source, but to a depression of the channel

The *first cost* of the Kirby rill was not, altogether, one hundred pounds. The *distance*, about ten miles: watering (besides the town of Kirby) two villages, and a line of cultivated waterless upland country, about four miles in length.

Besides the first cost, which was raised by subscription, a SUPERINTENDANT has ten pounds, a year, for keeping it in repair, and free from obstructions; which yearly salary is paid by the voluntary contribution of the persons benefited; each being rated agreeably to the estimated benefit received*.

M 4

III. FIELD

channel at the foot of the steep; the head of the valley (if such it may be called) being lower than the top of the precipice, at the given point. This shews the necessity of tracing the entire channel, with sufficient accuracy, before any other expence be incurred.

In the case of Kirby, the channel is raised, some feet, by a bridge-like mound of earth, thrown across the crown of the valley.

The same mound serves the purpose of conducting another rill, across the same difficult pass; from whence the Kirby rill takes an eastward, the rill of *Wellburn* (applied principally to the watering of pasture grounds) a westward direction.

* In a bill, which is now before Parliament, for inclosing the commons and remnant common fields of the township, a clause is wisely inserted to establish a *legal assessment* for the preservation of this rill.

III. FIELD WELLS. The skirts of the margin, formerly arable fields, but now grassland inclosures, were, on their being inclosed, equally destitute of natural and artificial watering places. Water for stock, however, was in a degree necessary; but the art of pondmaking was not then known. Wells were therefore sunk: the depth, twenty to thirty feet, according to situation. The water is raised, either by a pump or by a roller and bucket. The receptacles, stone troughs. Sometimes the well is sunk in the line of a fence, supplying two fields with water.

In situations which are low and flat, yet dry, pools are difficult to be filled; and wells of course more eligible. They are readily sunk, and seldom dry, in such situations.

6.

R O A D S.

THE SPIRIT of improvement has, in no particular, made greater exertions, than in the FORMING OF ROADS. Within my own remembrance, all the roads of the District lay

lay in their *natural* form ; that is, in a state of flatness, in flat situations ; or in hollow ways, on the acclivities of hills. Now there is scarcely a flat road, or a hollow way, left in the country. The more public roads, at least, are now universally *barrelled* ; the banks of the hollow ways having been thrown down, and the flat roads raised into a CONVEX FORM.

Formerly, the sloughs and inequalities were filled up, with a soft sort of gravel ; which, being soon reduced, or sinking in the mire, on which it was laid, only added to the quantity of dirt, and the heaviness of the road. Now, the universal COVERING, on this side of the Vale, is LIMESTONE, broken into small pieces, affording a rough but durable road.

But notwithstanding these exertions, and the quantity of labor and money which have been expended on these alterations, the roads are still far from being commodious, or even safe. The same folly of *doing over much*, which discovers itself, too plainly, in the roads of almost every District of the kingdom, is here manifest.

Roads can scarcely be *raised* too little : a *gentle descent* for rain water is all that is requisite

requisite or useful, and constitutes the sole intention of raising them. And the only *drain*, the side of a road requires, is a mere channel, with outlets, to prevent the water, thrown off by the road, from collecting by the side of it.

Therefore, IN FORMING A ROAD, all the preparation requisite (previous to the covering) is to form such a channel, on either side, by paring down the *outer edges* of the *site*; casting the soil upon the margin, or carrying it off, for some useful purpose. Not a spadefull of earth should be thrown into the middle of the site, except to level inequalities. The *convexity* (the slope formed by the paring on either side excepted) should be given, entirely, by the stones or other hard materials; which ought to be laid on a *firm surface*. If the site be naturally unsound, the soil ought to be removed, or to be made firm by underdraining. For until a FIRM FOUNDATION be obtained, it is highly imprudent to be at the expence of laying on a covering.

Nevertheless, a general method of RAISING ROADS, in this and almost every other reclusive District, is to dig a *deep ditch* on either side; to cast the loose earth into the *middle of the site*; and, on this, to pile a *narrow high*

high ridge of hard materials. The effect is, carriages being necessarily confined to one track upon the ridge of the road, the materials, which are not pressed into the loose dirt beneath, are soon cut through, by the wheels of carriages always passing in the same ruts ;—through which, the artificial bog, below, rises to the surface.

The method of REPAIRING is equally erroneous. Instead of the ruts being closed, by pecking in the ridges on either side of them, or by filling them with a *few* additional stones; the entire road is covered with a *thick coat*: and so often as fresh ruts are formed, so often is this expensive, and therefore doubly absurd, method of repairing repeated; until having laid coat over coat, and piled ton upon ton, unnecessarily, a mound of earth and stones, resembling the roof of a house, rather than a road, is formed.

The FORMING and REPAIRING of ROADS incur a heavy tax, on landed property; and the SAFETY of roads is a matter of public concern.

Some years ago, the Legislature paid considerable attention to this subject, and extended their authority, perhaps, as far as could be done, with propriety.

It

It might be difficult, perhaps, to frame a *general law*, for the FORMING of Roads; because different situations require different FORMS. In low situations, a common drain, or a ditch, by the side of a road may be necessary; but, in absorbent upland situations, neither of them are admissible: the road ought to fall, gently, to THE FOOT OF THE HEDGE BANK, on either side, when it leads through a lane of a suitable width; or, to THE FOOT OF A MOUND OF EARTH, raised (with the parings of the road) for the purpose, when the lane is too wide, or the road passes over an open country. In low retentive situations, where deep DRAINS are requisite, similar mounds ought to be formed, as GUARDS to the SHORES or DITCHES *behind* them; openings being made, at proper distances, for the passage of the water collected by the road.

The CONVEXITY of a road ought to be such as will throw off the rain water, which falls on it, without endangering, in any degree, a *top load*.

Before a TOP-HEAVY LOAD can be *overturned*, the entire weight must be thrown upon the wheel or wheels of one side; consequently, the nearer it approaches to the
dangerous

dangerous equipoise, the greater injury the road will receive.

Thus, suppose a loaded waggon to weigh two tons. Upon level ground, each wheel would sustain half a ton ; but, upon a shelving road, steep enough to bring the load to the equipoise of overturning, the entire weight would rest upon two wheels, only ; each of which would, in this case, sustain one ton ; consequently, if we reckon pressure as injury, the damage done by a carriage, at the point of overturning, is twice as much, as that which is caused, by the same carriage, on level ground ; and the nearer it approaches to one or the other of these extremities, the more or less injury the road will sustain by it.

Nor is the injury, the road itself is subjected to, the only evil effect of a steep-sided road. The ADDITIONAL FRICTION which is thereby caused, between the inner naves of the wheel and the body of the carriage, &c. (or between the iron work which severally belongs to them) gives an addition of *resistance to the team* ; whose extraordinary exertion ; on this account, is at once injurious to themselves, and to the road.

Most of the ROADS about the METROPOLIS, and many parts of the GREAT NORTH

ROAD

ROAD between Gunnerby Hill, in Lincolnshire, and Ferrybridge, in Yorkshire, are, for road surveyors, proper subjects of study.

The surveyors of roads, in general, are as uninformed, or as inattentive, about the REPAIRING of roads, as they are about the forming of them.

RUTS are the principal enemies of a *barrelled* road. On a *waved* road they serve as conductors to convey off the water: but, on a *convex* road, the descent of the water ought to be, immediately, from the crown to the channels on either side.

The great art, therefore, in the MANAGEMENT of CONVEX ROADS, is to form them, in such a manner, as to *prevent ruts*, as much as possible; and, if they appear, to be attentive in *doing them away*, before any material injury take place.

The obvious method of PREVENTING RUTS is to keep the road low, at the crown, and guarded, at the edges; so that even top loads may be drawn over *every part*, with conveniency and safety.

Upon the roads above specified, it would be difficult to endanger the most top-heavy load; except by running wilfully upon the hedgebanks. *Every foot*, from side to side,
is

is travelable road; and every part impartially travelled over.

On the contrary, upon the roof-like roads, of this and other countries, the driver of a top-heavy load *dare* not leave the top of the ridge; and the drivers of loads which lie lower, for a variety of reasons, follow the beaten track: even horsemen, who are timorous, are *afraid* to leave it; and those who are not so, pursue it for obvious reasons; no other part of the road being beaten, or convenient to travel upon.

Of a road, properly formed, the immediate channel on either side (being a species of *washway*) is frequently the cleanest, firmest, and, if freed from stones and other obstructions, the pleasantest HORSE PATH. But who, possessed of common prudence, would ride upon the tender brink of an unguarded ditch?

The effect is notorious: horses, and carriages of every kind, are equally confined to the same narrow track, upon the ridge; frequently consisting of two ruts and a middle path, with no better *quatering*, for horses which draw double, than there is in a narrow by lane, or over a rutty common.

The

The method of KEEPING CONVEX ROADS IN REPAIR is *not* to permit them to be worn into ruts and holes, until they be impassable, and then to load the whole surface, sound or unsound, with a thick coat of materials; but to pay, from time to time, due attention to the wearing of them.

Ruts and hollows, which are yet too shallow to require to be filled in, should be opened, on the lower side, to prevent water from standing in them; but those, which are too deep for this operation, should be levelled in, without loss of time.

Upon *stone roads*, this may frequently be done, by *collecting loose stones*, and chipping off the neighbouring *protuberances* (equally *dangerous* on the surface of a road) and burying them in the hollows to be filled up; thus removing two principal evils of stone roads, in doing away a third.

But additional materials being, in many cases, requisite, they ought to be laid ready in proper recesses; for the purpose of leveling inequalities, as fast as they are made; and thereby preventing the evil effects of the worst enemy of a well formed road,—*standing water*.

The

The road between Lynn and Wisbech, over the marshlands of Norfolk, is formed entirely of *silt*, a species of sea mud, so fine as to be scarcely palpable; nevertheless, with the precautions of *keeping the surface free from standing water*, and of *levelling in the ruts and hollows*, with a hoe, *so fast as they are formed*, it is, in wet weather, one of the finest roads in the kingdom.

I have observed, in other parts of the island, roads, covered with nothing but common *sand*, kept in good condition, by the same easy means. And the roads, which have been held out as patterns, are all managed, whether of *gravel* or of *stone*, in a similar way.

Indeed, all well managed TURNPIKE ROADS have men *constantly employed* upon them, for the purpose of *repairing small breaches, in order to prevent large ones*; and every TOWNSHIP ought to employ a ROAD-MAN, or WORKING WAY-REAVE, one or more days, in each week, throughout the year, for the same excellent purpose.

Instead of exhausting the whole of the statute duty (as it is called) in laying on coat upon coat, at some certain season of the year, and letting the roads lie until the return of

that season, as much neglected as if they did not belong to the township;—such parts, only, as are worn too thin, should be covered: a sufficiency of materials being reserved, and distributed in the most convenient manner, for repairing occasional breaches.

Before I close this section, two particulars require to be spoken to :

The width of roads ; and

The height of hedges on the sides of roads.

The Road Acts, passed in the thirteenth year of the present reign, order, that every “ horse or driftway ” shall be made eight feet *broad* ; and every “ cartway ” leading to a market town, shall be twenty feet *broad* ; that the *lane* of every “ highway ” shall be thirty ; and the *lane* of every “ turnpike road ” shall be sixty feet *wide* ; without specifying any particular BREADTH OF TRAVELABLE ROAD.

In some few situations, as in the bottom of a narrow valley, between two hanging woods, and where a ditch and a mound of earth are requisite on either side of the *road*, a *lane*, sixty feet in width, may be, in some degree, necessary. But, in ordinary situations, that width incurs a *waste of land*, without any adequate advantage. Indeed, upon ele-
vated

vated heights, and in other exposed situations, the traveller is thereby deprived of the *shelter*, which is required, and which a closer lane would afford.

Nor does the loss of culturable land, and the circumstance of exposing travellers unnecessarily to the inclemency of the weather, constitute, in this and other cases of a similar nature, the sum of impropriety; *grassy lanes* are the greatest nuisance an occupier of land can have in his neighbourhood: and it would be well if some *general law* could be instituted, for their regulation.

In the last section, it was mentioned, that in the *Sinnington Inclosure Bill*, an admirable clause is inserted, respecting the grass of the roads to be set out. For the first ten years, no stock whatever are to be *turned loose* into them; nor, after that time, are they to be *common*; the surveyors, for the time being, having a power to *let* them, and *apply the rent to the repair of the roads of the township*.

With respect to the drying of roads, after rain, more depends on the HEIGHT OF THE HEDGES, than on the width of the lane. The crown of a barrelled road, thirty feet wide, with hedges kept down to four feet high, will dry, nearly as soon, as if no hedges were

near it, and much sooner, than a road in the middle of a lane, sixty feet wide, with hedges and perhaps a line of coppice wood, as may frequently be seen, thirty or forty feet high, rising on each side of it; depriving the road entirely (unless when the wind happens to blow lengthway of the lane) of a free communication of air.

In low, and indeed in ordinary situations, high hedges, on the sides of roads, are doubly hurtful: they are not only injurious to the road itself, but, in close weather, are offensive to the traveller, and very injurious to the beasts of burden and draught, which are employed upon them. The Highway Act therefore wisely orders, “that the possessors
“of the land next adjoining to every highway
“shall cut, prune, and plash their hedges.”

But this salutary clause has, hitherto, been very little attended to. In many counties, it would be difficult to find an instance, in which it has been obeyed, or enforced.

The magistracy of this county, however, may claim superior merit, in this respect. The road between York and Doncaster, near forty miles, is singularly well kept in this particular scarcely one licentious bush

is

is left: and many of the less public roads of the county are laid open in a similar manner.

But excellent as this regulation undoubtedly is, in low as well as in ordinary situations, — more especially where roads lead through old inclosed countries, in which lanes are frequently too narrow, — it would, if indiscriminately enforced, be greatly detrimental, in wide lanes and exposed situations; where *shelter*, rather than a current of air, is desirable,

However, the execution of this law being in the hands of magistracy, its evil tendency may be easily checked, without injuring the more general intention,

7.

SHORES* AND EMBANKMENTS.

THE DIVERSITY of country, which the District under survey exhibits, requires

N 3

a varied

* SHORES. This term has been criticised, through a want of its import being sufficiently attended to. It comprizes not only SEWERS and other ARTIFICIAL SUR-

a varied exertion of art, with respect to SURFACE WATER. Upon the hills, art is required, to *retain* it upon the surface ; in the lower parts of the Vale, art is equally wanted, to *hasten* it to the river, or general outlet.

It has been already mentioned, that much of the bottom of the Vale is, by natural situation, liable to be overflowed by the rivers in times of flood. Nevertheless, every part of it, I apprehend, is so situated as to be capable of being laid sufficiently dry, by the rivers at dead water.

Therefore, the only exertion of art, in this case requisite, is, to open sufficient SHORES from the rivers to the grounds to be laid dry ; sinking sufficient DITCHES, from the shores ; and sufficient DRAINS, from the ditches.

Many

FACE DRAINS, but every NATURAL CONDUCTOR and RECEIVER of SURFACE WATERS. It is here used, as a GENERAL TERM, which is necessary in a work of this] nature. It includes every Passage, Outlet, or Vent, that assists in freeing the SURFACE of the soil from collected water : whether it be a Kennel or Strand,—a made Ditch or Sewer,—a Rivulet, Brook, or River of whatever magnitude,—or the Sea itself.

See the words SEWER and STRAND, in the PROVINCIALISMS. (1796.)

Many efforts, of this nature, have been made, with spirit and with success. The WEST MARSHES, in general, are a striking instance: for although they lie upon a flat, and but barely above the level of the waters of the Derwent, they are, at present, kept principally in an arable state, and chiefly in wide flat beds. Nevertheless, by keeping open furrows, deep ditches, and clean shores, the land, in general, is left as free from superfluous moisture, as if it were elevated a mile above the Derwent.

But the EAST MARSHES (and some other smaller portions of the Vale) still remain a disgrace to the country; lying, chiefly, in a state of *fenn*—provincially “Carr;”—overrun with sedges and other palustrian plants; which afford, during a few months in summer, a kind of ordinary pasturage to young stock. In the winter months, they are generally buried under water, and, in the summer months, are subject to be overflowed.

The remedy, in this case, (and in other cases of a similar nature,—of which almost every District in the kingdom affords an instance) is, to BANK OUT THE RIVER, which winds through the middle of it; and, in

doing this, TO SINK A COMMON SHORE, ON THE OUTER SIDE OF EACH EMBANKMENT.

If, at the lower end of these SHORES, the RIVER lies *sufficiently low*, at the time of dead water, to receive, freely, the drainage of the marsh, the work may be completed, at an inconsiderable expenditure, compared with the magnitude of an improvement of this nature. FLOOD GATES, placed at the outlets, to give vent to the surface waters, collected within the site of improvement, and to prevent the waters of the river, in times of floods, from flowing back upon it—are the only additional requisites.

If the surface of the *river*, at dead water, should be found to lie *too high*, for the necessary depth of the *shore*, MARSH MILLS *, placed in the lower parts of the site, will, in any ordinary case, do away the deficiency of fall.

The expence of a MILL is, in the first instance, considerable ; besides an annual expence of repairs, and attendance. But supposing the first cost to be one or even two hundred pounds, and the repairs and attendance to be ten or even twenty pounds, a year, the whole expence would be inconsiderable, when

* See NORF. ECON. MIN. 118.

when compared with the improvement of converting, 'perhaps, two or three thousand acres of *unproductive fenny grounds*, into ARABLE, MEADOW, and PASTURE LANDS, of *five*, or perhaps *ten times its value*.

In the case immediately under notice, mills, if requisite, could be effective on one side of the river only. The RIVULETS and BROOKS, on the north side of the Derwent, are too copious to be discharged by a mill. But, by embanking those rivulets, and by furnishing each compartment of the marsh with a mill, the desired improvement might, on a certainty, be made. On the south and east side of the Derwent, less difficulty would arise: the embankment of one rivulet, perhaps, would be found the only addition requisite to the general improvement *.

It may be unnecessary to say, that the excavated mold of the SHORES ought to go towards raising the BANKMENTS; thus obtaining, in one operation, the two principal means of improvement: or that *main ditches* ought

* Since writing this article, a meeting of the proprietors of these marshes has been held, to consider of an application to Parliament, for *straightening and enlarging the bed of the Derwent*! But the proposal was over-ruled.

ought to be led from the shore, into the area of the site to be improved.

One thing, however, may not be so obvious: namely, the SITUATION OF THE BANKS, WITH RESPECT TO THE RIVER.

If the BANKS be set upon the *immediate brink*, as in general they are, they become liable to be injured, by the smallest *deviation* of the RIVER. Besides, the waters of floods being, by this means, confined (supposing a bankment on either side) merely to the bed of the river, the banks require to be raised to an unnecessary *height*.

But if the lines of embankment be run at a proper *distance from the river*, as ten, twenty, or thirty yards, the BANKS are placed out of the way of danger, from the RIVER; and a greater area being left for the waters of floods to spread over, their rise will be proportionably less, and the requisite *height* of bank will of course be lessened, in the same proportion.

Theory may conceive a *waste of land* by this means; but experience shews, that such an apprehension is ill grounded. The embankment is equally beneficial to the land it encloses, and to that it shuts out from the river. The enriched waters of floods, now
confined

confined by the banks, deposit, on the inclosed slips, the particles which, hitherto, they had scattered over an extent of country. By this means the swamps, and hollows of the slips, are presently filled up; and, in time, the entire surface is raised.

I have observed an instance of this kind, in which the ground, on the river side of the bank, has been raised, near a foot, above the natural level of the ground, on the other side of it.

By this elevation of surface, the land is not only laid dry, but, if the waters be of a good quality, is at the same time enriched.

These slips, if of sufficient width, are singularly well adapted to the purpose of OZIER BEDS: and are eligible PASTURE GROUNDS. The banks are places of safety, for stock to fly to, in floods; a species of refuge they had not, when the whole lay open.

The EXPENCE of embankment, in ordinary cases, and under proper management, is far from excessive.

This Vale affords more than one instance of RIVER EMBANKMENTS. *Brawby moor*, containing about three hundred acres of low marshland soil, over run, in an open state, with furze and rushes, together with some
inter-

interspaces of sedgey grass, was liable to be overflowed by the river Seven, which runs on the *upper* side of it; the Rye, which washes it on the other side, being its natural shore,

These three hundred acres are the entire property of the EARL OF SALISBURY; and, in their open state, were let out in one hundred gaits, for young stock, at ten shillings each gait, producing his lordship, in that state, fifty pounds a year.

The embankment cost about sixty pounds; namely, about three quarters of a mile, at one shilling a yard. But the ruins of an old bank lessened the expence, in this case.

The bank, when finished, was about seven feet high; wide enough, on the top, for cattle to walk upon; sloped sufficiently to prevent its shooting, or being trodden down by cattle; and faced with green sods, to guard against the floods.

This improvement is worth tracing. Besides the embankment, which, if the old bank had not assisted, might have cost one hundred pounds, a road, through the middle of the site of improvement, was requisite to be formed;—the whole to be inclosed; and some erections to be made. Suppose the
road,

road, the inclosure, and the buildings to cost three hundred pounds, the whole expence would amount to four hundred pounds, or fifteen to twenty pounds, ayear.

The rent, in the first instance, was, I believe, fixed at eight shillings an acre. Three hundred acres, at eight shillings, produce one hundred and twenty pounds ayear; so that, in the outset, there appears to be a clear improvement of fifty pounds, ayear. In twelve or fourteen years, it may be worth twice that rent, the soil being deep, and of a quality which, though not rich, is suited, by situation, to both corn and grass. When the stipulated improvements are made, by the first occupiers, the three hundred acres will be worth, at least, two hundred pounds ayear; namely, FOUR TIMES ITS FORMER VALUE.

Another instance of river embankment occurs in *this* township. The commissioners, under the Act of Inclosure, have wisely secured the lower grounds to be inclosed, from the waters of floods, which have, hitherto, occasionally overflowed them. The remedy, in this case, was easy: a partial embankment, only, was necessary; and the bank, in the parts where it was wanted, seldom required

to be raised, above two or three feet high. Nevertheless, the advantage obtained, at this easy expence, is that of enabling the respective occupiers of the lands under inclosure, to change them, from a state of unproductive sward, to that of arable land ; and, by that means, to improve them, *perhaps*, to three times their present value.

If, in the MANAGEMENT OF ESTATES, any superior faculty be requisite, it is that of being able to strike out and execute INTRINSIC IMPROVEMENTS ; such as give a *permanent* increase of RENTROLL,—without diminishing the RESPECTABILITY of its owner.

8.

F E N C E S.

THE PARTICULAR articles which require to be noticed under this head are,

1. Gates,
2. Fence Walls,
3. Posts and Rails,
4. Dead Hedges,
5. Live Hedges.

I. GATES.

I. GATES. The common field gates of this country are, in general, made *slighter* and much *taller* than those of other Districts. In Surrey and Kent, three feet eight or nine inches is the ordinary height of a gate ; which is, there, composed of four common bars, and a strong top rail. Here, gates have generally six or seven bars, all equally slight ; and the common height is five to six feet.

HORSES are the greatest enemies of gates. A low gate, let its strength be almost what it may, is no fence against a resolute powerful horse. If he can place the *muscular part of his chest* firmly against the top rail, scarcely any strength of wood can resist him. But if the top bar be placed high enough, to receive his *windpipe*, instead of his chest, his power of injuring the gate is, in a manner wholly, taken away. It is, therefore, no wonder that, in a country where the breeding of horses has long been a common practice, HIGH GATES should have grown into common use.

The HANGING OF GATES is an art little understood, even by the hangers of gates themselves ; though highly interesting and useful in Rural Economy.

A person, here, who has paid unusual attention to the subject, and who has, in reality,
made

made himself master of it, still continues to hang his gates upon *pivots*, fixed at the feet of the hartrees *.

This was undoubtedly the original method of hanging gates, and is, perhaps, all things considered, the best.

It is probable, that, in the infancy of the art, the foot of the hartree was itself formed into a pivot, while the upper part of it was confined to the post, or perhaps to a tree, with a rope or a withey.

In the instance under observation, the upper part of the hartree is hung, in the usual manner, with a hook and eye ; and the foot of it is shod with a PIVOT OF IRON, set upon a large *hard stone*.

The great ADVANTAGE of hanging gates on PIVOTS is that of their being *readily altered*, with respect to *fall*, or *catching* : moving the pivot stone a quarter of an inch, this way or that, with an iron crow, is frequently a sufficient regulation : the pivot, too, takes part of the *weight* of the gate.

But gates, to be hung with pivots, require a peculiarity of CONSTRUCTION. Every gate, when

* HARTREE ; the principal end-piece, into which the bars are mortised, and by which the gate is hung : opposed to the HEAD, the opposite end-piece.

when shut, ought to hang *plumb* and *level*; that is, the head should be, everyway, upright, and the bars horizontal.

This requisite, however, and at the same time a proper *fall*, cannot be had in a gate made, *in the square*, and with a *straight hartree*. Either the lower part of the hartree must be *crooked*, or the gate must be made, *out of the square*; that is, the bars must stand somewhat obliquely, not perpendicularly to the hartree; and in *this* case the pivot must be placed, not in the center, but on the *outside of the foot*: the first to throw the point of the pivot *behind* the pin of the upper hook, to give the gate a fall when open at right angle; and the latter, to throw the point of the pivot *without* the pin of the hook, to give the gate a fall, at the post, and make it catch with certainty.

This being understood, it is easy to conceive that, if the lower end of the hartree be crooked, and if the elbow or convex side of the bend be directed, not to either post, but towards the middle of the gateway, the necessary falls may be had, without throwing the gate out of the square, or the pivot out of the centre of the hartree.

I mention this method of hanging gates

the rather, as, notwithstanding its advantages, it is grown into almost total disuse; owing, it is very probable, to a want of knowledge of the proper principle of construction. I shall, in another District, have occasion to speak fully of the method of *hanging gates on hooks*.

II. FENCE WALLS. The common homestead fence of this District is *wall*; either of brick or stone.—*Battoning*, in the Norfolk manner, is unknown, and close *paling* seldom made use of.

In the morelands, and upon the limestone heights, stone walls are the common field fence. Live hedges, are, in these situations, slower of growth, and more difficult to raise, than they are, in warmer better soils; whereas, stones are plentiful, lying, in some places, an incumbrance to the surface.

Inhospitable and unornamental as naked stone walls may seem, they are, in many situations, the most eligible fence:—cheap and durable.

They are of two kinds, “double” and “single:” the latter, which are composed of single stones, piled one upon another, are a sufficient fence against stock, provided they be raised high enough; but are liable to be
thrown

thrown down, by the wind. The former, which are built in the common wall manner, but without mortar, are more expensive in the first instance ; but, if properly raised, will endure for a length of time, with little or no repairs.

The MODERN FENCE WALL, of which many miles have been built in consequence of the new Inclosures that have lately taken place, is of the following form and dimensions.

The *height* five feet. The *width*, at the base, twentytwo inches, narrowing to sixteen inches, at the top ; which is *coped* (as a guard against sheep) with the widest and flattest of the stones, laid aside for this purpose.

A frame of wood, of these dimensions, is set up, as a *gauge*, and as a guide to the builder.

The lowest *price* which has, I believe, been given for raising, carriage, and walling, is five shillings and sixpence, for a rod of seven yards. But a shilling, ayard, may be taken as a more medial cost. Each yard takes about a three-horse-cart load of stones.

III, POSTS AND RAILS. In most countries, the prevailing *temporary fences* are hurdles. Posts and rails are only used for

the defending of young hedges, and for other permanent purposes; being generally put down by a carpenter, and are seldom removed, until they become useless as a fencing material.

But, here, they are considered in a different light. They are (speaking generally) the only temporary fencing in use. If a piece of ground require to be divided, for one season, or for a few weeks, a line of posts and rails are run across it; not by a carpenter, but by a common farm laborer. And, when the purpose is answered, they are removed and laid up, for another occasion.

I mention this circumstance, as posts and rails are more durable, and a much better fence against horses and cattle, than hurdles are; and the labor of putting down, and removal, is much less than inexperience may imagine.

IV. DEAD HEDGES. The *stake-and-edder* hedge prevails in this District, and is, in general, constructed with uncommon skill. The superiority of construction lies, principally, in the *eddering*.

In other places, the EDDERS are *trimmed* up to naked rods: here, the spray, towards the top, is left on. These sprayey tops, being wound

wound round the bodies of the succeeding edders, lay hold of the stakes, thereby preventing their rising. If the twigs of the edders be insufficient, brambles, or other pliable brushwoods, are wound in, with the same intent.

But the most effectual way of preventing cattle from throwing off the EDDERS, which method is here sometimes practised, is to carry on the two operations of eddering and filling together, *burying the sprayey tops of the edders among the filling*; by which means they are effectually secured from the horns of cattle; and even, while they remain sound, from the hands of hedgebreakers.

V. LIVE HEDGES. The management of hedges appears to me a matter of so much importance, in the management of an ESTATE, and is a subject to which I have paid so much attention, that I always find it difficult, whenever I sit down to write upon it, to confine myself within due limits.

In this District, I find ample matter to animadvert upon. The finest hedges in the kingdom (if any one particular spot can claim a superiority) are now growing in *this* neighbourhood; and more new ideas, respecting the management of hedges, have oc-

curred to me, in the District now under notice, than in all the others I have examined. It would therefore be wrong to treat the subject slightly, in this place. But I will endeavour to compress the matter, which I have accumulated, within as narrow a compass as may be.

The subdivisions which the subject, in this place, requires are :

1. The species of hedgewood.
2. The method of planting new hedges.
3. The method of defending them.
4. The method of cleaning and training.
5. Their after management.
6. The treatment of old hedges.

1. The prevailing HEDGEWOOD is the *hawthorn*. Formerly, it was in this, as in other places, gathered in the woods and rough grounds. But, at present, and for some years past, “ garden quickwood ” has been pretty generally, though not yet universally, planted.

But although the hawthorn is the common hedgewood of the District, and, in ordinary situations, may be the most eligible, I have seen *crabtree* used on cold soils, as well as in bleak situations, with great success. In an instance where crabtree and hawthorn were
planted,

planted, alternately, by way of experiment, the crabtree plants have outgrown those of the thorn, in a striking manner. In six years, they have acquired stems as thick as the wrist, with tops sufficient as a fence, against ordinary stock.

Upon the Wolds, I have observed the *elder*, a plant which braves the bleakest situation, made use of as a hedgewood; but never saw it planted with sufficient judgment, to answer the intended purpose. Nevertheless, in the abundance and luxuriance of this plant, upon the most exposed parts of the Wolds, it is evident that, with proper management, it might at least be made a skreen to better hedgewoods.

The *holly* I have seen raised (in the practice of a man who has paid great attention to the business of hedgeplanting, and in this particular with great success) with an unusual degree of rapidity and certainty.

The secrecy of the art lies in the *time of transplanting*: a holly transplanted, in SUMMER, scarcely receives a check from the removal: a fact, this, which few planters are aware of.—Thousands of hollies are every year destroyed, by removing them in the winter months,

2. PLANTING. The common *method* is to turn a sod, ten or more inches wide, upon the brink of the intended ditch, and, behind this, to set the plants, in a leaning posture ; covering the roots with some of the best of the mold the ditch affords ; and, behind the plants, to lay the remainder of the excavated earth, in a low broad bank.

The ordinary *ditch* is very small ; barely affording mold to back up the plants with. Neither the ditch, in front, nor the bank, behind, are considered, as they are in Norfolk, a guard to the young hedge.

The Pickering INCLOSURE BILL orders, that the ditches, in the *lower grounds*, when they are necessary as drains, shall be made four feet wide, and two feet and a half deep. But, for the *uplands*, no limits are prescribed ; the distance, between the outer brink of the ditch, and the line of hedgewood, being the only thing limited. This width is fixed, throughout, at four feet and a half. In this case, the outer brink of the ditch being the boundary line of each man's property, and a narrow ditch, only, being wanted, a slip of whole ground is left between the inner brink and the first turned sod, for planting the quick behind.

One deviation, however, from this general mode of planting under the Inclosure Bill occurs. In this instance, a narrow trench, only, is dug against the boundary line ; leaving sufficient room, between the inner brink of the trench, and the line of quick, to place the dead fence ; by which means the owner of the land, getting his young hedges within his own premises, is no way liable to the ill-nature or negligence of his neighbours. And, instead of laying in the plants behind the first-turned sod, the ground is dug four or five feet wide, and the plants set in a trench, upright, in the nursery manner ; having, in this case, a line of prepared earth on either side to feed among.

Nor is this the only instance I have met with, in the District, of PLANTING HEDGEWOOD ON A LEVEL. The same judicious planter has, in dividing upland inclosures, planted hedges without any ditch whatever. His practice has been to plow a slip of ground, on each side of the intended line of the fence, the preceding spring ; and having previously dunged it, to plant it with potatoes. During summer, the land is repeatedly cleaned with the hoe ; in autumn, the potatoes being removed, the entire slip is gathered into
a ridge,

a ridge, with the plow; and, the ensuing spring, the quick is planted, nursery-wise, in a trench, run along the middle of the ridge. The success of this method has proved equal to what might be expected, from management so obviously judicious.

Another new idea, which has been struck out, and carried into practice, by the same person, is that of SORTING HEDGEWOOD PLANTS: not according to the thickness of their stems, or the size of their tops, but agreeably to the strength of their roots. When the plants are put in, indiscriminately, the strong soon outgrow, and overpower, those which are weaker. But plants, which are judiciously sorted, rise together, without destroying each other. Besides, in doing this, many worthless plants are thrown aside, and those which are weak are reserved for suitable situations; while the strongest are planted where the greatest strength is required.

But the *boldest* idea I have met with in hedgeplanting is that of BURYING THE PLANTS! by covering up their heads, an inch or more deep, with mold: and this, not as an experiment, but in the practice of a common laborer.

The

The method of planting, in this case, is the common one of setting the plants behind the "cape-fod," or first-turned spit. But instead of leaving the heads two or three inches above ground, the plants are shortened, and the heads placed about an inch below the surface.

Observing a work of this kind, presently after it was executed, I waited with impatience to see the event. In due season, the plants made their appearance; not in a number of irregular spreading shoots, as from an exposed head; but rising, with one, or perhaps two or three, straight upright shoots, of peculiar strength and beauty.

They did not, however, rise at the same time; some of them remaining in the ground, several weeks, after the earliest made their appearance. The covering of mold, therefore, ought, perhaps, to be as fine, and laid on as light as possible, to prevent obstructions to the tender shoots in rising *.

The

* On close examination, I find, the tallest strongest shoots rise from such as were barely, or perhaps impartially, covered with mold: such as were buried deeper are, *at present* (in the month of August, the first year of planting), shorter and weaker; owing, perhaps, to their rising later in the spring. It is therefore probable that the lighter and thinner

The advantage of burying the plants appears to be the valuable one of giving the young hedge an upright tendency, and thereby preventing the strength of the roots from being expended, on useless side shoots. Plants, thus raised, take the growth, and probably the habit of SEEDLING plants. The roots, in this case, may be considered as PREPARED SEEDS, furnished with a peculiar strength of vegetation.

3. DEFENDING. Posts and rails are the common dead fence. Sometimes one, sometimes two rows: a most expensive way of defending a young hedge.

In the lower parts of the Vale, where stones are not too numerous, and where deep ditches are requisite, the Norfolk method might be introduced with great propriety *.

But, in stoney soils, that method is impracticable: and, there, two rows of posts and rails, or some other dead fence adequate to them, are, in most cases, absolutely necessary to good management.

It

thinner the covering, provided it be sufficient to prevent side shoots, the more eligible is this practice. Sorting the plants, too, agreeably to the strength of their roots, is probably requisite.

* See NORF. ECON. Sect. LIVE HEDGES, Subd. V.

It is therefore wise, in the framers of Inclosure Bills, to secure the right of placing fences, during a certain number of years, upon neighbouring allotments, as guards to the young hedges *.

I have observed, in more than one instance, the good effects of setting a sharp *ridget of earth*, on the *outer brink* of the ditch, as a guard to the face of young hedge plants; especially against horses. In one instance, a young hedge was defended by two small ditches, one on either side, with banklets of this kind, without any dead fence whatever; and this, too, against well bred hunters: such as would, in a chace, have taken the hedgling and both ditches, without hesitation. Cattle are less terrified with these devices.

The practice of pricking thorns into the first-turned sod, upon the *inner brink* of the ditch, as a guard to the face of the quick against sheep, affords a degree of temporary security; but deprives the plants of that air and exercise, which is necessary to a luxuriance and firmness of growth.

4. TRAINING. This department of the management of hedges is too much neglected, in

* See Sect. INCLOSURE, p. 79.

in all countries. The planting, and the first erection of guard fences, generally receive a tolerable share of attention. But repairing these fences, from time to time,—destroying weeds,—and giving the young plants a proper tendency, are matters which are seldom considered as essential to success.

In this District, the *front fence* is, in general, too little attended to, or neglected too long; the young plants being frequently brouzed and stunted, before the necessary guard be thought of, or placed.

With respect to *weeding*, however, the District is above mediocrity. But in regard to *training the plants* themselves, by striking off the luxuriant side shoots, and thereby promoting the upward growth of the hedgeling, it is very deficient.

I have, nevertheless, had frequent opportunities of observing one instance, in which this requisite business, in the raising of hedges, has been executed in, perhaps, a singular manner. In this instance, each plant is trained with a *single stem*,—*pruned* in the nursery manner.

One advantage, of this method, is that of rearing *every* plant, with a degree of certainty; the tops being, in this operation, attended

to,

to, as well as the stems: those of the stronger plants being lessened, to give head-room to the weaker.

Another very great advantage, especially on a sheep farm, is that of getting the young plants out of harm's way. Sheep are dangerous enemies to young hedges; and every expedient to guard against their mischievousness, in this respect, deserves at least a trial. Strong plants, judiciously planted, and trained in this manner, may, with a degree of certainty, be got out of the reach of sheep, in three or four years.

The labor is considerable, but by no means excessive. In this one instance, the expence of labor appears to be greatly exceeded by the advantages obtained by it.

The pruning should be done in winter or spring, while the sap is down; or while it is rising; not in the summer season.

5. AFTERMANAGEMENT. In this department, the District under survey excels: not in the manner of cutting, but in the frequency of it. Many young hedges are cut, before they are twenty years old; and the cutting, of such as are thriving at least, is usually repeated, every five or six years; a practice which ought to be universally followed.

lowed. Nothing is more injurious to a hedge, than unfrequent cutting.

The prevailing *method of cutting* is that of “buck-heading;”—namely, cutting the stems off level, about three feet high above the level of the inclosure; generally winding a few straight boughs, horizontally, between the heads of the stems, to prevent stock from forcing through between them. A more *simple*, or a *cheaper* method than this, cannot, perhaps, be devised; especially as the *ditch* is seldom touched; the roots being purposely suffered to strike across it; by which means they enjoy free pasturage on either side.

On the Malton side of the District, the prevailing method of cutting is that of *plashing*, in the Midland manner: an operation which I shall have occasion to speak fully of, in its proper place.

6. OLD HEDGES. The practice of *re-planting* wornout hedges, in the Norfolk manner, I have not met with, in this District.

Stopping *breaches* with *dead hedging*, thereby effectually preventing their ever closing again, is a piece of unpardonable management, which is nowhere more prevalent, than in the Vale under observation.

One

One instance of exertion, however, in order to RECLAIM a live fence, from a row of large old thorns, the remains of a neglected hedge, occurs in this District, and would do credit to any country. It is the only one of the kind I have met with.

The bushes, or separate detachments of the old hedge, being trimmed, on both sides, and the main stems cut out, at the ground, or headed at such heights as circumstances required, the long slender boughs, growing in the line of the fence, were trained into the vacancies, with strong stakes, in the ESPALIER MANNER: a bank of earth having been previously thrown up, and the lowest ground-boughs LAYERED in it, in order to strike root, and send up fresh plants, to assist in filling up the vacancies, effectually.

This mode of treatment is not applicable to such hedges, only; but to every live hedge, in which wide VACANCIES are found. The best time for filling them up, in this manner, is when the hedge is felled to the ground.

Another instance of practice, in the management of old hedges, which had been planted on broad banks, with *ditches on either side*; and which, through the narrowness of

the pasture, and the neglect of timely cutting, were become stunted, and thin of stems, merits notice.

The thorns, in this case, were felled to the ground ; the ditch, to the southward or westward of the hedge, re-made ; and that, on the north or east side of it, *filled up* with the excavated mold. By these means, the plants were supplied, immediately, with fresh pasturage in made earth ; and let loose to feed, at large, in the adjoining inclosure. The effect is striking.

Perhaps, REVERSING THE DITCH of an old hedge (with a *single* ditch) might INVIGORATE it, in a similar manner, by giving the plants a fresh field of pasturage. The experiment, however, ought to be tried with caution. Depriving old plants of *all* their main roots (though they were at the same time cut off by the ground) might be dangerous.

GENERAL OBSERVATIONS. From what has been said, on the ordinary treatment of hedges, in this neighbourhood, it is evident, that their superiority is not owing to an excellency of management. The richness of the soil ; the neglect of the ditches ; the frequency of cutting ; and, above all, the pre-

sent

sent AGE of the hedges, account sufficiently for their PRESENT FLOURISHING STATE.

Those which strike the eye with a peculiar luxuriance of growth, are about FIFTY YEARS OLD : and it is abundantly evident, that hedges, growing in a good soil, may, until they have reached *that age*, be *headed fence-high*, with a degree of safety. But, on a nearer view, it appears to me equally evident, that the practice cannot be exercised, *in perpetuity*, with any degree of propriety.

On examining hedges, which have not been planted SEVENTY YEARS, and which have been treated invariably in that manner, I find they have already received irreparable injury. The underling plants are, already, so far destroyed, as to leave vacancies, of three feet or more in width ; while the master plants, now no longer of themselves a fence against sheep, have acquired stems of a tree-like size.

FELLING TO THE GROUND, and training a range of *new stems*, is the only effectual remedy of this evil. But this, when deferred too long, is impracticable, or at best uncertain. Large old stems will not, always, survive the operation ; but if applied,

in time, and with due care, the remedy is certain.

It would be difficult, perhaps, to prescribe rules for FELLING HEDGES TO THE GROUND, by their *ages*, or the intervals of time between the fellings. *Perhaps*, no **hedge** ought to stand more than FIFTY YEARS, from the first raising, nor more than THIRTY YEARS, between the *fellings*.

But, by their SIZES, and the state of their growth, some general rules may with propriety be mentioned. No *stem* (howsoever healthful, nor how sizeable soever to the neighbouring stems), of more than a *foot in circumference*, ought to be suffered to remain standing.

If there be a great *disparity*, as there generally is, in the *sizes of the stems*, either the entire hedge ought to be felled, before any of them acquire the limited size; or, in heading them, the larger ought to be *shortened, proportionably to their respective sizes*; in order to lessen their destructive tendency, and to give the weaker an opportunity of gaining, at least, a temporary ascendancy *.

If

* An expedient of this kind I have seen executed with every appearance of success.

If the plants, let their age and size be what they may, grow *mossy*, or wear the general appearance of *stuntedness*, they ought to be removed, that a more healthy race may be trained up, in their stead.

The same as to *HEADING*. No particular age can be pointed out, for the first cutting; nor can any certain interval of time, between the headings, be prescribed, with strict propriety. Soils and situations influence the growth of trees; and, viewing the management of hedges in a general light, the tops ought to acquire a degree of *USEFULNESS* before they be taken off.

A *bough*, *six or eight inches in circumference*, is large enough for a *stake*; and, when the strongest have got to this size, the remainder are generally fit for the *fillings* of dead hedges; that, therefore, is the state in which they ought to be cut.

It would, in my opinion, be better management, *in a man who occupies his own estate*, to burn them, and give their ashes to the winds, than to suffer them to remain on the stems, after they have reached that size.

But, *in a tenant*, who has no permanent interest in the hedges he occupies, neglect is

less criminal.—It matters not, to him, whether the live hedges upon his farm remain sufficient fences, *one* or *two* centuries. He is no way concerned in the purchase value of the estate, unless it be in the depreciation of it. His plan of management (if he has any in this respect) is to make his hedges subservient to his own interest ; especially when he has no certainty of continuing in possession.

These circumstances are not mentioned, here, with a view of breeding ill-blood between landlords and tenants ; but to endeavour to convince the former, that it is incumbent on them to pay some attention to the live hedges upon their estates.

It is now a custom, pretty generally adopted, upon wooded estates, to appoint *woodwards*, for the preservation of timber and underwood.—And, upon every large estate, lying in an inclosed country, it is, in my opinion, equally necessary to appoint a HAYWARD, for the preservation of its hedges.

AN EXPERIENCED HEDGER would, perhaps, be the fittest for this employment. In ordinary cases, as where heading, only, might be requisite, *orders* might be sufficient ; but to the raising of new hedges, and the renewal
of

of old ones, *personal attention* ought to be paid, not only to the planting and the felling, but to the fencing and the weeding, until the new or the renewed hedge be out of danger.

9.

HEDGEROW TIMBER.

THIS is an interesting subject to the proprietors of inclosed estates : and no country affords a better field for observation, than that under survey.

The old-inclosed parts of this neighbourhood, when seen at some distance, have the appearance of woodlands ; the inclosures being mostly narrow, and full of hedgerow timber.

The age, on a par, is about fifty years. In half a century more, the value of the timber, of some parts of it, if suffered to stand, will probably be equal to the value of the land : a circumstance, this, of no small import to the *owner*. But the detriment to the *occupier* requires to be considered.

In this country, it seems to be a general idea, founded perhaps on experience, that

lofty hedgerows are *beneficial* to *grass land*; increasing its productiveness, by their warmth, and giving shelter and shade to pasturing-stock. The roots, even of the *ash*, are considered as *inoffensive* to land, in a state of *grass*; in which state, the grounds thus loaded with hedges and timber trees, is almost universally kept.

Indeed, it would be impossible, in their present state, to occupy them as *arable land*. There are entire inclosures, every foot of the areas of which must necessarily be occupied by *ashen roots*; nevertheless, they give an ample supply of hay and pasturage. One to two tons of hay an acre. And, in many of them, three acres will afford sufficient pasturage, for two cows, of the largest size. The rent, from thirty to forty shillings an acre. Strong evidences, these, that the *roots* of the *ash* are not very injurious to *grass land*.

It is evident, however, that the *oak*, when suffered to thrust its *low spreading head* into the inclosure, is injurious to the herbage beneath it; that the *leaves* of the *ash* are very detrimental to aftergrass; and that the *hedges* are annually receiving irreparable damage;—no general plan of training up the trees, with tall stems, having, I believe, in any instance been adopted.

GENERAL OBSERVATIONS. From what is here mentioned, we may conclude, that the advantages accruing from the planting of timber trees, in the hedges of inclosed common-fields, of a soil, and lying in a situation, adapted to *grass*,—are far superior to any disadvantages arising therefrom, even where they have been suffered to grow, in a state of almost total neglect.

Land which has lain open, and which has been kept in a state of *aration*, during a succession of ages, is equally productive of *grass* and *trees*. And it is generally good management, to let it lie in *grass*, for some length of time, after inclosure.

In this neighbourhood, it is evident to common observation, that *trees* flourish, with unusual vigour, in the newly inclosed lands of *arable* fields; and that their injury to *grass* land is inconsiderable, when compared with the value of the *timber* they produce. The *low spreading heads* of the *oak*, and the *leaves* of the *ash*, appear to be the chief inconveniencies, of these two species of trees, to *grass* land.

But an alternacy of *corn* and *grass* is generally eligible, on lands which our ancestors have made choice of for common fields; and the *roots* of the *ash* are not only obstructions

to

to the plow, but the general nature of the plants is, in a singular degree, inimical to *corn*,

It is, therefore, necessary to eradicate the *ash* from the hedgerows, before the land be again broken up for arable; or to preclude this tedious operation, in the first instance, by planting oak in its stead.

The HEAD of the OAK may be raised to such a height, as not to be injurious to *grass*, nor to the *hedge* while yet in a youthful state, even though it were suffered to run up to its natural height.

Whenever the inclosures are broken up for *corn*, the *hedges* ought, in common good management, to be headed, and kept in a dwarfish state; in which case TALL-STEMMED OAKS would be a valuable source of TIMBER, without being, in almost any degree, injurious, either to the HEDGE, or to the CORN, growing under them.

But the TRAINING OF YOUNG OAKS, and the GENERAL MANAGEMENT OF HEDGEROW TIMBER, cannot, with any degree of prudence, be left to a mere occupier. Viewing hedges as nurseries of timber, a HEDGEMAN becomes essentially necessary to every landed estate.

DIVISION THE SECOND.

WOODLANDS
AND
PLANTATIONS.

I.

NATURAL WOODS.

THE VALLIES, which sever the limestone heights, on the north side of the Vale of Pickering, and give passage to the rivers and brooks, that take their rise in the morelands, it has been said, are mostly filled with wood. Formerly, it is probable, considerable plots of woodland were likewise scattered, at the feet of those heights; but, if there were, most of them are now done away: some few patches, however, remain.

On the southern banks of the Vale, too, are scattered some valuable tracts of woodland.

The

The TIMBER of these woods is chiefly OAK, with a small proportion of ASH. BEECH, even upon the limestone heights, a situation to which it is peculiarly adapted, seldom if ever occurs, in *natural* woods: a degree of evidence, this, that the OAK and the ASH are *natives*, lineally descended from the ancient forests, which heretofore occupied these hills; and that the BEECH is *not a native* of this part of the kingdom. The limestone heights of Gloucestershire, Herefordshire, and South Wales, are hung on every side with BEECH, growing, to all appearances, in a state of nature.

The information which I have gained, respecting the woodlands of the District under survey, falls under the following heads:

1. Raising.	4. Timber.
2. Disposal.	5. Bark.
3. Felling.	6. Carriage.

I. RAISING. The practice of raising woods from ACORNS, a practice which, formerly, has evidently prevailed, in different parts of the island, cannot easily be traced, in this. In some few instances, however, *art* may have been employed; but the generality of the old, well timbered woods, which were standing within the present century, but
which

which now are nearly extinguished, have, it is highly probable, got up, *fortuitously*, from seedling plants rising in *neglected roughets*: a species of propagation, which is still observable, in almost every woody waste; and is, in truth, NATURE'S ONLY METHOD of propagating TIMBER OAKS.

An OAK, which springs from seed, in an *open plain*, throws out horizontal branches, on every side; and, being browsed upon by cattle, takes a *shrub-like* form. But oaklings, rising in a *thicket*, are secure from the bite of cattle, and are taught, by selfpreservation, to shoot upward, with a *single stem*; the sooner to gain the ascendancy of the shrubs, which surround them.

This early *habit* of shooting upward, perhaps, afterward promotes an upward tendency. It is also probable, that plants, whose *constitutions* are naturally weak, are unable to cope with the difficulties which surround them; consequently, that those, which struggle through hardships so evidently great, are of an aspiring robust nature. Be this as it may, it is observable, that oaklings, which rise naturally in thickets, generally make tall vigorous trees.

But most of the woods, which *at present*
remain,

remain, on *this* side of the Vale, have been raised from STOOLS of timber trees, formerly taken down.

This method of raising woods is called “springing” them; or, with greater propriety, RE-SPRINGING them: a practice which has long been prevalent, in this country; where COPPICE WOOD is of less value, than it is in most others,—*fuel, bedding materials*, and a few *firkin hoops* being the only saleable articles.

When a wood is intended to be RESPRUNG, the timber is felled a few inches above ground, leaving the bark of the stools as entire as possible.

Before the young shoots make their appearance, the GROUND is, or ought to be, finally cleared, from the fallen timber and topwood, and the FENCES made up. If the timber, or topwood, be suffered to remain among the stools, until after they have made their first shoot, much mischief is necessarily done, in getting them off. And, if the young saplings be subjected to the bite of stock, especially in their infant state, the loss will not readily be retrieved.

Formerly, defending the timberlings from foreign enemies was the only care bestowed
upon

upon “ young springs ;” and this, perhaps, not very rigidly attended to. Now, the fences are pretty strictly kept up, and the plants, themselves, from time to time *weeded*, — provincially, “ looked ;” — that is, THINNED ; the underwood and cross-growing timberlings being, in this operation, removed ; to give air and room, to those which are more promising.

The business of WEEDING is generally deferred, until the weedling plants have acquired a degree of USEFULNESS ; by which means the operation becomes doubly profitable.

The *first thinning*, I believe, is generally given, as soon as the undergrowth is large enough for STAKES, and the *second*, when it is long enough for RAILS ; the former being given at about *ten*, the latter at about *twenty* years old. At every *ten* years, afterward, for half a century at least, posts as well as rails may, generally, be taken, with double advantage.

TIMBERLINGS, trained in this way, will reach, in a tolerable soil and a mild situation, thirty to forty feet in height, and will measure from twenty to thirty inches in circumference, in about forty years.

It

It is observable, that when a wood is intended to be sprung again, for timber, the entire ground is, or ought to be, cleared of every tree, great and small. Single trees,—STANDARDS,—provincially, “wavers,”—left in a wood, under an idea of their being too young and thriving to be taken down, seldom retain a luxuriance of growth, after the neighbouring trees are removed; but, by their drip and shade, do certain injury to the young saplings, rising round them.

It is also observable, that there is a great inequality of success, in raising timber in this way: while, in some instances, there will be a tenfold sufficiency of shoots to be trained; in others, too great vacancies will be found. This may be owing to MANAGEMENT, or to the AGE of the timbers taken down. A *young wood* may be sprung, afresh, with a degree of certainty. But, *perhaps*, there is danger, as well as difficulty, in regenerating an *old* one.

II. DISPOSAL. It has already been intimated, that the large seedling timbers, which formerly reared their heads in this District, are now nearly extirpated. There is, I believe, but one estate, and that not of considerable

considerable magnitude, upon which any *large* timber can now be found.

1. The AGE OF SELLING is, therefore, lower here, than in most other countries. There are instances of sapling woods being sold, at *forty or fifty years old*; and, when situated near a new Inclosure, are thought to pay better, at that age, than they would have done, had they been suffered to stand a longer time.

One sold, at *forty years old*, neated to the seller, about twenty pounds an acre. The soil a cold springy clay,—worth, in a state of ordinary improvement as arable land, seven or eight shillings an acre. But it would cost a considerable portion of its value, to change it from a state of woodland, to that state. Therefore, considering the cost of improvement, in one case, and the profit of the weedling plants and underwood in the other, it is much more eligible to keep this, or any wood similarly circumstanced, in its present state, or to improve it, to the utmost, as woodland, than to subject it to *agricultural* management*.

VOL. I.

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* See WEST OF ENGLAND, MINUTE 35, for Calculations on this subject.

2. The MODE OF DISPOSAL is to sell it, in the gross, *standing* ; by *auktion*, or by *private contract*. The former, however, is, for the seller, the most eligible mode of sale ; where men of property and character are bidders.

The buyers of timber are, generally, men of business ; professionally versed in the value of wood ; and able to make their own valuations, with sufficient accuracy ; while the seller is obliged to rely on the abilities, and the integrity, of a third person ; who, being uninterested in the sale, wants the main stimulus to rigid accuracy.

But, in a SALE BY AUCTION, with a sufficient number of bidders, the seller's valuation is of little consequence : the bargain, in this case, is transferred to the bidders : the *contest* is not between seller and buyer, but between bidder and bidder ; both (or all) of whom being judges of the lot under sale, the seller has *more* than a fair chance of selling it, for its full value.

3. The METHOD OF VALUING grown timber is to estimate every tree : not, however, by an exact admeasurement of each ; but by taking the dimensions of a few, with sufficient accuracy. The valuer, having by
this

this means adjusted the eye, he depends afterward upon that alone ; except now-and-then checking it, with the rod and line. If the trees be of moderate girt, the rod and line are sometimes dispensed with, by men in great practice ; who, with the arms only, can take the girt, and the ground length, with sufficient accuracy.

III. FELLING. The practice of resprouting fallen woods being the established practice of the country, that of felling timber trees *a few inches above ground* is universally prevalent. Grubbing, or grub-felling in the Norfolk manner, is seldom, if ever, practised.

The PEELING of oak timber is generally done, by the day ; the laborers being, I believe, invariably employed by the timber-merchant, not by the tanner : practices which are productive of a considerable saving of bark. Men, working by the ton or the quarter, or tanners, paying by weight or measure, will not peel the boughs sufficiently near ; it is against their interest to do it. But it is the interest of the timber merchant, or of the tanner, if he purchase by the gross, or by the ton of timber, to peel, so long, as the bark will pay for the labor. This accounts

for the smallness of the twigs, usually peeled, in this country : if the bark run freely, twigs, not much thicker than the finger, are frequently stripped.

The method of DRYING BARK, in this District, is generally the common one of setting it, in a leaning posture, against poles, lying horizontally, on forked stakes. But, in a wet season, or when the ground is naturally moist, it is laid across a line of topwood, formed into a kind of banklet, raising the bark about a foot from the ground. By this practice, no part of the bark is suffered to touch the ground : and it is, perhaps, upon the whole, the best practice, in all seasons and situations.

IV. FALLEN TIMBER. For OAK timber, the principal *markets* have, hitherto, been the ports of Whitby and Scarborough. But there is, now, very little ship timber left. The seedling woods are few and small ; and saplings, in general, standing thick upon the ground, perhaps three or four from a stool, rise too straight, and are yet much too young, for the purposes of ship building. It is a fact, however, that at present (1787) the spirit of ship building is so flat, that, scarce as
ship

ship timber is really become, the market is now overstocked.

The medium PRICE of *ship* timber, delivered at the ports, is 3*l.* to three guineas, a ton, of forty feet. But the price varies with the times, and still more according to the quality, that is the *crookedness* of the wood. Oak timber, fit for the purpose of the *house-carpenter*, may now be bought for fourteen pence, a foot.

ASH timber is chiefly worked up by the *cartwrights*; and by *coopers*, into butter-firkins, and dairy utensils. The *price*, one shilling to eighteenpence a foot, in the stick.

This similarity of price, between ash and oak timber, is owing to several causes: the present want of demand for oak; the present scarcity of ash; and to the circumstance of ash timber being, on the spot, at its principal market; whereas oak requires to be carried twenty miles, before it can be placed in a similar situation.

V. BARK. Oak bark is here sold to the tanner, ready prepared for his use. The timber merchant not only dries it in the wood, but stacks or houses it; and generally shaves and *chops* it, ready for the tanpit; selling it to the tanner, at so much a quarter.

This custom appears to be founded on a false basis : the tanner is, or ought to be, the best judge of the mode of preparation, and the operation ought to pass under his eye.

The practice of *grinding* bark does not seem to have yet got footing, in the District : whenever it does, it will of course bring the preparation of bark into its proper channel.

The medium *price* of chopt bark, is 10s. 6d. a quarter.

VI. CARRIAGE OF TIMBER. The carriage of timber has long been a distinct employment, in *this* part of the District. The price for twenty miles, the nearest distance, is about 15s. a ton, of forty feet ; for forty miles, the longest distance, 30s. has been given :—this is, in both cases, *ninepence, a ton, a mile.*

Supposing the price of oak timber, at the ports, to be three pounds, a ton ; and that it lies at the western extremity of the Vale ; the carriage reduces the price, in the place of growth, to 30s. a ton ; which is *one half* of the price at market. But timber, which grows only twenty miles from the ports, is reduced in price, by carriage, only *one fourth* of its market price ; and that grown, with-

in ten miles of market, no more than *one eighth* *.

These circumstances show, in a striking manner, the advantage of propagating timber, in the neighbourhood of ship yards; and point out the impropriety of raising it, at a distance from water carriage; or some established inland market.

2.

PLANTATIONS.

THE SPIRIT OF PLANTING can scarcely be said to have gained a footing in the District under survey.

Of late years, the passion of taking down has been much stronger, than that of raising

Q 4

up.

* Some years ago, the price of ordinary ash timber, at Scarborough, was 11d. a foot. There was an instance of a parcel being carried, somewhat more than twenty miles (the inland market being of course overstocked) at the rate of 5d. a foot, for carriage. This reduced the price to 6d. a foot, in the place of its growth. Had such ash timber been carried, at those prices, from the extremity of the Vale, it would have neated only 2d. a foot.

up. Indeed, in some parts of it, the NATURAL WOODLANDS, which abound, render PLANTATIONS the less necessary.

But upon the *wolds*, and other *heights* adjacent to the Vale, SHELTER PLANTATIONS are every where wanted; and it must be a matter of astonishment, to every one who gives it a moment's reflection, that the spirit of planting should, in these situations, have lain dormant so long.

Upon the WOLDS, however, it has at length risen into action. Sir GEO. STRICKLAND has scattered a number of sheltering clumps, upon the heights, towards Malton; and Sir CHRISTOPHER SYKES and others are placing skreen plantations, upon the bleak swells of the higher Wolds. Should this laudable spirit diffuse itself into a general practice, not only the face of this fine passage of country, but the very soil, or at least its produce and value, will in a short time be changed.

The skreen plantations, which I have observed upon the Wolds, are all of the MISCELLANEOUS kind; — pines and deciduous trees of various sorts, mixt together.

It strikes me, however, that the BEECH, alone, would be the most eligible tree to be propagated upon the Wolds: it is peculiarly
adapted

adapted to calcareous soils ; and thrives with singular vigour in exposed situations. Upon the chalky hills of Surrey and Kent, it is the prevailing timber tree. Upon the hills about Amersham in Buckinghamshire, too, a chalky soil, the beech thrives with uncommon beauty and luxuriance : and its wood seems to be growing daily into estimation.

Sowing the masts, in drills, and cultivating the intervals, is perhaps the most eligible method of propagating thist ree, for the purpose here mentioned.

In the VALE, the almost only plantations, which have been made with a view to utility, are small clumps of *Scotch fir*, planted for the purpose of giving shelter, and shade, to pasturing stock.

There is one instance, however, in which a more regular plan of improvement has been chalked out, and executed.

This instance of improvement, having been prosecuted with judgment and perseverance, and by one from whom I have received more useful ideas, in planting, than from any other man I have conversed with, is noticeable.

The

The *site* of improvement was a low moory swamp, lying barely above the level of a rivulet, running by the side of it. The *subsoil* a blue clay: the *topsoil* a black peat earth, of an irregular depth; varying from a foot to three or four feet deep. The *turf*, a mat of rushes, sedges, and other palustrian weeds, equally unpalatable and unproductive, either of hay or pasturage; some parts of it being dangerous to stock. The *form* triangular: the *area*, containing nine or ten acres, an entire flat; except a gentle descent towards the longest corner. The *situation*, though low, extremely chilling, being exposed, on every side, in a naked watery plain.

The IMPROVEMENTS, obviously requisite in this case, were *warmth*, and a proper degree of *dryness*.

To obtain these, the rivulet and the surrounding ditches were deepened; and a deep counter ditch, main drain, or *shore*, sunk at a distance from the boundary fence; leaving an irregular border, of five to ten yards wide, entirely round the area of the site of improvement; which, by this simple operation, alone, was removed sufficiently out of the water's way; except at the lowest extremity,

mity, where the main drain had its outlet into the rivulet.

The BORDER, too, by the same operation, was laid sufficiently dry, for the purpose of PLANTING.

The lowest extremity, and the moister part of the margin next the rivulet, were planted with AQUATICS; the drier parts with FOREST TREES of various species.

It is now fourteen or fifteen years, since this improvement was first set about. The border of planting begins already to have, at some distance, the effect of an entire plantation of equal circuit; while the area, within, enjoys all the advantages which shelter can give it.

What remains to be said, here, respecting the effect of the improvement under detail, is to mention the present state of growth, and the comparative progress, of the different SPECIES OF FOREST TREES, upon a DRAINED MOORY SOIL *.

It is an opinion of the improver of this plot of ground, that a DRAINED MOOR is the *driest* of soils: an opinion founded on his own experience. The summers of Eighty-five

* The further improvement of the *area* will be mentioned in its proper place.

five and Eightyfix were very dry ; the plantation made little progress, and the area was unproductive. This year (1787) the summer has been moist ;—the trees and the grass are equally luxuriant.

MOORY SOIL, when perfectly dry, repels water like a dry sponge ; but, like this, when once it is saturated with moisture, it retains it longer, than common earth does. But a moor, effectually drained, and placed above the level of collected moisture, is not readily filled with water ; it may therefore be justly ranked among the *driest* soils.

This accounts for the rapid progress which the BIRCH and the SCOTCH FIR (both of them mountain plants) have made in these plantations. In the drier parts, they are more than twenty feet high ; far outstripping every other species ; except

The NORWAY SPRUCE, which, for the first ten or twelve years, at least, thrives vigorously. But some plants of this species, planted fourteen or fifteen years ago, are getting ragged, and appear to be in an unthriving state. But whether this be owing to the severity of the late winters, or whether the roots, being now cramped for room, have got down to the uncultivated moor, or the

the cold barren clay which lies under it, is uncertain.

The AMERICAN SPRUCE, too, the PINE-ASTER, the LARCH, and the VIRGINIA CEDAR, thrive abundantly, in this soil and situation; but none of these have been planted more than seven or eight years.

The ASH and the BROAD-LEAVED ELM also make a promising appearance; but the OAKS, though they look healthy, do not shoot upward*.

On the moister parts, the ALDER takes the lead. But the ASH, the ASP, the POPLAR, and the OSIER, grow with sufficient luxuriance, to shew, that their situation is perfectly agreeable to them.

A patch of OZIERs were kept down, experimentally, as an OZIER BED. The growth was luxuriant; and the profit, the second to the fifth year, ample; the produce, at least,
five

* This, however, is thought to be owing more to late SPRING FROSTS, than to the nature of the soil. *Silver firs* have done worse than the oaks; but shoots, several inches in length, have been evidently observed to be nipped off, by *summer* frosts; which, it is observable, are much stronger in low than in high situations; owing, perhaps, to the greater quantity of moisture in the air: This, at least, accounts for the extraordinary quantity of *bees*, collected in low situations.

five pounds, an acre, yearly : but the plants beginning to decline, and an ozier ground not being calculated to give the required shelter, the experiment was not pursued.

GEN. OBS. Upon the whole, it appears to me evident, that the OSIER, the ASH, and the BIRCH are the most eligible species to be planted on a DRAINED MOOR ; keeping them in a state of COPPICE WOOD, and felling the inner and outer edges of the border, alternately : the first fall for stakes ; the second and succeeding falls for rails.

By this means a PERPETUAL SHELTER would be secured.

A few SCOTCH FIRS, planted at proper distances upon the margins, and kept pruned on the inner sides, would add a degree of ORNAMENT, without being destructive of UTILITY.

DIVISION THE THIRD.

AGRICULTURE.

I.

FARMS.

THE SIZES OF FARMS vary, in different parts of the District. On the WOLDS, they are principally *large*; in the VALE and the MORELANDS, *extremely small*.

Considering the VALE, distinctly, more than half of its lands are laid out, in farms, under twenty pounds, a year. Perhaps, three fourths of the Vale, and the lands belonging to it, lie in farms, of less than fifty pounds, a year.

In the west marshes, and in the RICHER PARTS OF THE VALE, low moist situations, inhabitants are thinner, and farms larger.

But viewing the Vale, collectively, there is not, perhaps, in *this* kingdom, another District of equal extent, and of which

HUSBANDRY is the PRIMARY OBJECT, which contains so great a number of *farms*, or rather parcels of land in distinct occupation ; many of them being occupied, not by TENANTS, but by OWNERS *.

The advocates for SMALL FARMS will conceive, that a District thus laid out must necessarily excel in husbandry ; and that the superiority of management must, of course, be in proportion to their degree of smallness.

On the contrary, however, no country, perhaps, affords stronger evidence of the fallacy of those conceptions. A mixture of good and bad management is evident, in every quarter of it ; and it is on the LARGER, *not* on the *smaller* farms, we find a SPIRIT OF IMPROVEMENT, and a SUPERIORITY OF MANAGEMENT prevail.

Poverty and ignorance are the ordinary inhabitants of small farms : even the smaller estates of the yeomanry are notorious for bad management.

It is on the larger estates of yeomanry, and on the larger farms of tenants, we must look for the best practice of the District.

It

* When this was written, the WEST OF ENGLAND had not passed under my observation. (1796.)

It is not meant, that a regular gradation of management can be traced, by the magnitude of farms : many exceptions might be pointed out. Nor does it follow, from the evidence of this District, that *very large farms* are conducive to good management. An occupier of eight hundred or one thousand pounds, a year, is too fully employed, with the OUTLINES of management, to attend sufficiently to MINUTIÆ, much less to conceive and execute useful IMPROVEMENTS. His best management is to press forward, in the beaten track of the country he farms in ; depending upon the ampleness of his business, to make up the deficiencies, arising from the unavoidable neglect of minutial matters.

The CHARACTERISTIC OF FARMS, in the Vale, is GRASS, with a smaller proportion of arable land.

Formerly, the area of the Vale was principally grass, and the margins open arable fields. Now, the latter is inclosed, and principally applied to the use of the dairy ; while the former is much of it subjected to arable management.

Upon the whole, although the admixture of ARABLE be considerable, the Vale, in a general point of view, comes under the denomination of A GRASSLAND COUNTRY.

2.

FARMERS.

FROM WHAT has been said, in the last section on FARMS, a general idea of the FARMERS of the Vale may be gathered.

Among the *lower class of tenants*, little information can be expected, and still less from the *inferior yeomanry*, whose scanty possessions are too frequently marked, with an inferiority of management.

It is from the SUPERIOR CLASS OF YEOMANRY, and from some few PRINCIPAL TENANTS, we must expect to learn the best practice of the country. It is on the farms of men, whose independency, conversation, and perhaps reading, has led them to think, and act, without prejudice, we must expect to find a superiority of general management, and a spirit of improvement prevail.

It has long been observed in the ECONOMY OF NATIONS, that where liberty is established there commerce and the arts flourish. And

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it is equally observable, in RURAL ECONOMY, that where independency resides, there Agriculture improves. A monied man, cultivating his own estate, enjoys the highest degree of independency; a lease tenant the next; tenants at will the lowest.

It has already been intimated, that, in this District, tenants at will (some very few perhaps excepted) have lost all *confidence*, and consequently have lost even their *ideal independency*. They *dare* not *improve* lest some advantage should be taken of their improvements. It has also been said that leases are, yet, but little in use.

Therefore, among the YEOMANRY, alone, we must look for that degree of independency, which is essentially necessary to improvements in Agriculture.

No country, of equal extent, can boast of so numerous a body of yeomanry, as the Vale under survey; nor any country, I will venture to affirm, where industry and frugality are more conspicuous; or where a personal independency is more strongly rooted, among men in middle life.

3.

WORKMEN.

THE YEARLY SERVANTS of this District are noticeable, for the highness of their wages, and the lowness of their living, and for the length of their working hours.

The WAGES, of an able man servant, are twelve to fifteen pounds, a year. During the late war, fifteen to eighteen pounds were given !

But the simplicity of their DIET more than compensates for the extraordinary height of their wages. Milk still remains, here, a food of farmers' servants. In some places, animal food, three times a day, is expected ; here, once a day (except perhaps in haytime and harvest) is considered as sufficient.

In MALT LIQUOR, too, the farm servants of this country are equally moderate.

Nevertheless, if one may judge from their appearance, and from the quantity of labor they dispatch, their mode of living is conducive to HEALTH.

The

The TIME OF CHANGING SERVANTS, which prevails through this country, is *Martinmas* (Nov. 22.) *. The conveniency of this time of changing servants, and the inconveniency of changing at Michaelmas, have been pointed out on a former occasion †.

4.

BEASTS OF LABOR.

THE LONG AGITATED dispute, about the superiority of OXEN or HORSES, as beasts of draught, may here be considered with singular propriety. But, I am afraid, even this country will not furnish sufficient evidence, for a final decision.

Formerly, and from time immemorial, four or six oxen, in yokes, led by two horses, also double, were the invariable “draught”

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or

* Except in CLEVELAND, where *Mayday* is a more general time of changing.

† See MINUTES OF AGRICULTURE—Dates 10 and 12 OCTOBER 1775.

or team of the country ; not only upon the road, but in plowing. Even in stirring a fallow, four oxen and two horses were generally considered as requisite. And, in breaking up a fallow, two men and a boy were the common attendants, of this unwieldy expensive team.

At present, there is not, perhaps, throughout the Vale, a single ox employed in tillage : two horses, with whip reins, without a driver, is now the universal plow team for all soils, in almost every state.

Upon the road, however—that is to say, in farm carriages—oxen are still in use ; but seldom more than a single pair to a carriage ;—generally at the pole, with two or three horses, at length, before them. Besides, a number of entire horse teams, now, travel upon the roads ; things which, formerly, were unknown in the country.

On a general view, and in the opinion of men whose age entitles them to be judges of the subject, there is not kept, at present, one-fourth of the working oxen, which formerly were employed, in the Vale.

Shall we hence argue, that because oxen have declined, they are ineligible as beasts of draught ? It might be unfair to do it.

.. There

There are two evident causes of the decline of oxen, in this country.

Formerly, there was not only much more land in tillage, but the plow of those days was a heavy ill shapen implement, requiring at least one pair of oxen extraordinary to draw it; yet, unwieldy as it was, the quantity of land, then in tillage, required that it should be worked, in all seasons. At present, the plow in use is admirably constructed;—light, and well formed for passing through the soil. With this plow, and with the land in season, it is found, that the two horses alone, without the oxen, are sufficient for the purpose of tillage. This, in a country where the breeding of horses had long been an established practice, was a sufficient cause of *the disuse of oxen in plowing*.

Their *decline upon the road* is, in part, owing to the same cause. Four horses make two plow teams, and, occasionally, a road team. This accounts, in some measure, for the increase of horse teams, upon the road; but it is not the only cause of their increase. When oxen were in common use, the *roads* lay in their natural flat state; deep in winter, and soft to the hoof in summer: now, they are universally a rough causeway of lime-

stones, in all seasons unfriendly to the feet of oxen. Even shoeing is found ineffectual, when they go constantly upon the road.

Under this change of circumstances, it is no wonder that the use of oxen should have declined. On the contrary, it appears to me a matter of surprise, that so great a number should still be employed; a circumstance which, in my mind, evinces their utility as beasts of draught.

Even the timber carriers (an industrious and wary set of men) continue to use them; though their sole employment be upon the road. . They not only find them able to stand working, every day, provided their feet do not fail them; but, what is much in their favor, they are found to stand long hours, *better* than horses going in the same pasture. An ox, in a good pasture, soon fills his belly, and lays himself down to rest; whereas a short summer's night scarcely affords a horse time enough to satisfy his hunger.

Another advantage of oxen is, here, held out. In stiff pulls of every kind, most especially in going up steep hills, a pair of oxen are considered as a sheet anchor. Horses, it is argued, are fearful, and soon lose their feet, in a steep slippery road; while oxen,
where

where they are unable to proceed, will stand their ground. Indeed, oxen seem to be considered as essentially necessary, in an awkward hilly country.

This idea, in a country where half bred hunters are the principal horses used in draught, is no doubt well founded; but where thorough bred cart horses are in use, it loses much of its weight.

But what are thorough bred cart horses? Why, a species of strong, heavy, sluggish animals, adapted solely to the purpose of draught; and, according to the present law of the country, cannot, without an annual expence which no one bestows upon them, be used for any other purpose.

This species of beasts of draught cost, at four years old, from twenty to thirty pounds; will, with extravagant keep, extraordinary care and attendance, and much good luck, continue to labor eight or ten years; and may, then, generally be sold for five shillings, a head.

If we had no other species of animals, adapted to the purpose of draught, in the island, nor any one which could be naturalized to the climate, cart horses would be truly valuable; they being much superior

to

to the breed of saddle horses, for the purpose of draught.

But it appears to me evident, from the experience I have had, and the observations I have made, that were only a small share of the attention paid to the BREEDING of draught oxen, which now is bestowed on the breeding of cart horses; animals equally powerful; more active; less costly; equally adapted to the purposes of HUSBANDRY, (if harnessed with equal judgment); less expensive in keep and attendance; much more durable; and infinitely more valuable after they have finished their labors—might be produced*.

OXEN, here, are all worked in *yokes*, and always *led*, by one or more horses. They are usually broke in, at two or three years old; and worked, until they be rising six; when

* I do not mean to intimate, that any breed of oxen would be equally fit as horses, for the *road only*: I have had no experience of either of them, in this kind of employment; which is foreign to the present subject: let carriers and draymen make their own election. All I contend for is, that, were a proper attention paid to BREED, oxen, and spayed heifers, equally as fit for the purposes of tillage, the carriage of manure, hay, corn, and fuel, and for every other purpose of DRAUGHT, in the ordinary business of HUSBANDRY, as the heavy cart horses at present in use, might be obtained.

when they are bought up, for the Midland, or South country graziers.

Considering oxen as *rearing cattle*, which are worked occasionally during the years of growth, this plan of management is eligible enough; but viewing them, abstractedly, as *beasts of draught*, that mode of treatment is very injudicious: they are worked while they are feeble for want of age, awkward for want of experience, and thick winded through a fullness of growth; and thrown up so soon as they have learnt to know their duty, and are become able to stand work.

A steer, like a colt, ought to be familiarized to harness, at two or three years old; but should never be subjected to hard labor until he be five years old: from which age, until he be fifteen or perhaps twenty, he may be considered as in his prime, as a beast of draught. An ox which I worked several years in Surrey, might, at seventeen or eighteen years old, have challenged, for strength, agility and sagacity, the best bred cart horse in the kingdom.

THE SPECIES of ox, worked in this District, will appear under the head BREED OF CATTLE.

5.

I M P L E M E N T S.

THE Implements of the Vale, which require to be noticed, are,

1. Waggons.	sledge.
2. Plows.	4. Molding sledges.
3. The common	5. Machine fans.

I. WAGGONS. The waggons, and other wheel carriages of the Vale are, in general, considerably below the middle size.—A full sized waggon does not measure more than forty cubical feet : the ox cart—provincially “coop”—about twentyfour feet.

Their *construction*, though in many respects singular, is passed over, as being in nowise peculiarly excellent *. But they have a *defect* which

* Excepting in two petty improvements, which I have have not observed elsewhere. The one is a simple improvement of the WHEEL-WASHER—provincially “Runner”—which frequently sticking in the end of the nave, wears off the ends of the linch-pin ; thereby losing its principal intention. The improvement is made by placing a knob, on the outer surface of the Washer ; which, catching the

which requires particular notice ; as it is not peculiar to the Yorkshire waggon ; but is common, in a greater or less degree, to the carriages of other Districts.

The Turnpike-road Act, made in the thirteenth year of the present reign, orders, “ that no pair of such wheels (common three inch wheels) passing on turnpike roads, being above twenty miles from London, shall be wider than *four feet six inches*, from inside to inside, to be measured on the ground ;” (that is, *four feet nine inches from middle to middle of the ruts*) “ under the penalty of five pounds !”

The waggons of the Midland counties (the size of them extraordinary large) run the width of five feet two or three inches, from middle to middle of the rut. Those of Gloucestershire (of the middle size) run four feet nine inches wide : those of the Vale of Pickering only four feet three inches.

All

the end of the linch-pin, prevents its turning round with the wheel ; by which means the entire friction is, as it ought to be, between the Washer and the end of the box of the nave. Accidents frequently happen, for want of this precaution. The other improvement is a FALLING DOOR, in the bottom of the fore part of the waggon ; for the more easy delivery of lime, coals, and other body loads.

All these widths are *much too small* for the respective sizes of the carriages: and how the framers of the Bill, above mentioned, could impose a restriction, evidently tending to destroy the roads, they were endeavouring to preserve, is a matter of some surprize.

In the article ROADS, page 172, the effects of carriages, passing upon shelving roads (of the nature of which every *barrelled turnpike road* more or less partakes) have been mentioned. The damage will always be, in proportion to the inclination of the road, to the height of the load, and to the narrowness of the span of the wheels, considered jointly.

The center of gravity of the load (including the carriage), and the two points of the peripheries of the wheels (of a two-wheeled carriage), which are in contact with the road, form a triangle. The extremity of damage is when the load is in the equipoise of overturning; the entire weight of the load and carriage resting, at that time, upon one wheel; which, in that case, injures the road as much as a load, of much greater weight, would, in passing upon a level road. Whenever either *side* of the triangle, above described, is brought into a perpendicular position, the load is in the injurious equilibrium.

These

These premises being duly considered, it is obvious, that there are three ways of reducing the perpendicularity of the line ; consequently, of preventing a loaded carriage from being placed in so destructive and dangerous a state. First, by raising the depressed corner of the triangle ; that is, by bringing the road nearer to a level : second, by shortening the sides of the triangle ; that is, by lowering the center of gravity of the load ; or, in other words, reducing the height of the carriage : third, by lengthening the base of the triangle ; that is, by widening the span, or placing the wheels farther asunder. These things are mathematically demonstrable ; but as they must appear obvious, to every one, acquainted with the rudiments of science, it would be wrong to load the present volume, with a more minute explanation.

But the injury of the roads is only one part of the mischief, arising from the wheels of carriages, running too narrow. The increase of draught (see *ROADS*, p. 173.), the extraordinary stress and wear of the carriage, and the evil effects of overturning,—are matters of still more importance, to farmers, and other proprietors of carriages.

It would, perhaps, be in vain to conjecture

ture the means, through which the present widths of the span of carriages have been established, in different countries; each of which has its particular width; otherwise, the difficulty of passing in rutty by roads would be greatly increased.

In the present state of husbandry and land-carriage, and the present state of roads, it appears to me evident, that GATEWAYS, alone, ought to prescribe bounds to the width of carriages.

Farm gateways measure from eight feet and a half to ten feet wide. I know no extraordinary inconveniency arising from a gateway of the latter width; and through such a gateway there would be no difficulty in conducting a carriage, with dished wheels, running five feet or even six feet wide. Five feet and a half would, perhaps, be found the best legal width.

This increase of width would operate, in a variety of ways, to the advantage of land-carriage. Roads would be less injured; team-labor would be facilitated; carriages would last longer; and loads would be less exposed to danger, than at present.

Nor would these be the only advantages: the increased distance, between the wheels, would

would admit of a proportional increase in the width of the body of the carriage ; and this of a proportional reduction of the height of the load. Advantages, these, besides the additional strength which the carriage would by this means receive, which appear to me too obvious to require further argument.

II. PLOW. The plow, at present in universal estimation in the Vale, is of the light, short, winding-moldboard sort, which, in different parts of the kingdom, goes under the name of the *Dutch plow*, or the *Yorkshire plow*.

On the construction of a ship, volumes have been written, without any universally received principles being yet established. The Bermudians, who build by the *eye alone*, without either drawing or gauge to assist them, excel all other nations, in the construction of small vessels (the almost only *produce* of their islands) ; which are remarkable as fast sailers, and notorious for lying nearer the wind, than other vessels.

Different as the ship and the plow may be, in magnitude and general appearance, there is some similarity, in the principles of their construction ; and the difficulty of fixing those principles, and of reducing them to a regular

theory, is nearly the same in both. The art of construction, in either case, is principally attained by practice.

In this District, the species of plow under notice is, in general, constructed better than it is, perhaps, in any other ; yet, even here, the plows of different makers pass through the soil, with various degrees of facility and execution : nevertheless, though I have paid some attention to the different makes, I find myself unable to detail the minutiae of construction. Even the general principles I must mention with diffidence.

The great difficulty, in the construction of a plow, is that of adapting it to all soils, in all seasons, and to all depths.

If the soil break up in whole furrow, every inch of *depth* requires, in strictness, a separate plow, or a separate regulation. Here rests the great objection to the WINDING MOLDBOARD, which admits of no regulation in respect of depth.

If the *semi-arch*, or hollow of the hindpart of the moldboard, be raised sufficiently high, to turn a thick furrow completely, it is of little use, in turning a thin one. On the contrary, if it be brought down sufficiently low, to turn a shallow furrow properly, it is impossible

possible to turn a deep one with it, in a workmanlike manner. There is not room for it within the hollow or semi-archway of the moldboard. The inevitable effect of this is, either the furrow is forced away, wholly, by the upper part of the moldboard, and set on edge; or the moldboard rides upon the plit, raising the heel of the plow from the bottom of the furrow; especially in plowing sward, or other whole ground.

AN UPRIGHT STERN, with a moveable HEELPLATE* to turn the furrow at any given depth, is, in this point of view, much preferable to a hollow moldboard; and if its use, in raising a crest of mold, for the purpose of covering the seed, be added, its preference is still more conspicuous; and I see no reason why the Yorkshire plow should not receive so valuable an improvement.

The FOREPARTS of a Yorkshire plow, of the best construction, are admirably adapted to insinuate themselves beneath the soil, and to raise the plowlice: a better form, perhaps, cannot be contrived.

But the plows, even of this neighbourhood, are far from being uniformly excellent, in

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that

* See MINUTES IN SURREY.

that respect. The NECK is frequently too thick and the BOSOM too hollow: the former creates an unnecessary friction; and the latter forms a receptacle for loose mold to lodge in; and both of them are detrimental to the turning of the plit. The bosom may be made too full, but the neck cannot, well, be made too fine, on the off or outer edge.

The righthand side of the socket of the SHARE ought to be brought down to a sharp angle, or rather to an edge; the under side being made flat, and as level as may be, with the under surface or soal of the plow. The part which is folded back, to lay hold of the bottom of the woodwork, too frequently forms a foul protuberance, on the soal; rendering the plow unsteady,—increasing the friction unnecessarily,—and, by raising up the fin of the share, preventing it from acting properly.

The form of the Yorkshire plow is not its only excellency: the ordinary PRICE of the wood work complete, is not more than seven shillings and sixpence! the iron work about twenty shillings, including plates for the landside and moldboard. *Cast iron plates*, somewhat resembling those of the Norfolk plow, are now coming into use, instead of
wooden

wooden moldboards. Those will reduce the general price still lower.

III. THE COMMON SLEDGE. This petty implement will be considered as unworthy of notice, by those who are unacquainted with the uses of it. Nevertheless, here, where it is in common use, it is in universal estimation.

For carrying harrows and other implements,—thorns and other rough wood,—turneps when the ground is tender, &c. &c. a sledge is, frequently, much preferable to a cart or a waggon. Some are made small and light, for one horse; others strong and large, to be drawn by a team of oxen or horses.

The principal singularity of construction consists in a valuable addition, to the common harrow sledge of other countries. This addition is made with two cross pieces (like the cross pieces of a cart or waggon), one fixed upon each end of the body of the sledge, projecting without the side pieces, about ten or twelve inches, at each end. Upon the extremities of these cross pieces are fixed two rails,—provincially, “shelvings,”—one on each side; thus increasing the width and hollowness of the bed of the sledge, and

thereby rendering it capable of carrying a larger load with greater steadiness.

IV. MOLDING SLEDGE. This implement, I apprehend, is peculiar to Yorkshire.

Its USE is that of smoothing the surface of meadows ; at the same time spreading the dung and molehills.

The CONSTRUCTION is that of the body of the common sledge, without its side rails and cross pieces ; the upper edges of the side pieces (of the body of the sledge) being, for this purpose, made perfectly straight.

In use, it is drawn with the face downward, and the side foremost, across the ridges.

Its EFFECT is different from that of the LANDPLANE, described in the MINUTES OF AGRICULTURE ; which, having a middle bar, *levels* the surface ; whereas this, having no middle bar, only *smooths* it.

The FRONT BAR (namely, the *side* which is drawn foremost) forces off wormcasts, the rudiments of anthills, and other protuberances of the surface ; also collects the dung of cattle and horses, the molehills, and other loose incumbrances, which lie in its way.

This collection of materials being driven before the implement, grind each other down,
fine

fine enough to lodge in the dimples and fissures of the sward; thus smoothing the surface in a twofold way; and, at the same time, mixing, reducing, and distributing the meliorating ingredients, in the most effectual manner.

The FRONT BAR is sometimes shod, with iron, projecting, with a hoe-like edge, before the wood work. But this is unnecessary; and is frequently injurious, in defacing the sward. The wood work itself, while the acting angle in front remains sharp, is perhaps the best: but the angle soon wears off; by which means the implement loses its effect, in removing the more stubborn protuberances. An iron bar fixed, *not beneath*, but in the *front* of the wood work, the lower edge being set flush with the face of the implement, acts in a similar way to the wood itself, without being so liable, as this, to be worn away.

The use of the HIND BAR is to give firmness to the implement, and to finish what the front bar may, by accident, have left incomplete; the manner of acting being in both of them the same.

The length or width of this implement is usually six to eight feet. The breadth, or dimension from out-to-out of the front and

hind pieces, four to five feet. The depth of these pieces six to eight inches : their thickness about three inches.

Additional weight, if required, is given by logs, stones, or other heavy materials, laid upon the cross bars which bind the two acting pieces together. In places where a particular exertion is requisite, the driver will add his own weight, by stepping upon the implement, and remaining upon it, until the occasion be passed.

V. WINNOWING MACHINE. This excellent machine is too well known, as a *curiosity*, in most parts of the kingdom, to require, in this place, a general description *. But the county under observation being the only one in which its *use* has been established, in COMMON PRACTICE, it merits, in this place, particular notice.

We are probably indebted to the Chinese, or other eastern nation, for the invention of this machine. I have seen it upon an India paper, drawn with sufficient accuracy to shew, that the draughtsman was intimately acquainted

* The late Mr. *Sharp* of London made it several years, *Winlaw* of Margaret street, Cavendish square, still makes it.

ed with its uses. The Dutch, to whom the invention has been ascribed, imported it, in all probability, from the East Indies. Let this be as it may, it indisputably came from Holland, into *this* country.

Its first introduction, into the Vale, was by a gentleman of this neighbourhood, about thirtyfive years ago. But the introducer committing this complex machine to the care of servants, without paying attention to it himself, it was, as might be expected, soon thrown aside, as useless.

Some time afterwards, however, it fell into the hands of a sensible substantial yeoman; who, with the assistance of a friend, discovered its usefulness, and reduced it to practice.

My father, who had made himself master of the excellencies and defects of this pattern, made one from it, with some improvements. This was the first which was made in the District, and perhaps the first which was made in *England*.

The utility of these being seen, by some discerning individuals, several others were constructed, under my father's direction. But, notwithstanding many of them were kept in common use, and visited as subjects of admiration,

miration, it was some fifteen or twenty years before they grew into popular estimation.

Within the last ten or fifteen years, the making of them has been an ordinary employment of wrights and carpenters. At present, there is scarcely any man, whose farming is considerable, without a "Machine Fan:" and, among the smaller occupiers, it is not uncommon for two or more to join, in the purchase and use of one of them.

The CONSTRUCTION of this machine has undergone several alterations, and some few improvements may have been made in it; none of them, however, of moment; except that of changing the materials of the sails, from boards to sheet iron. Its complexity is the only bar to its popularity. Should a happy simplification of it be hit upon, it will doubtless be received into universal practice.

The present *price* is about five guineas.

Its *uses* will be spoken of, under BARN MANAGEMENT.

6.

THE WEATHER.

THE BAROMETER, here, as in other places, has its advocates and its revilers. But neither of them appear to view it in its true light. The former speak well of it, because it has more than once saved their hay or their corn from damage: the latter revile, or perhaps break it, because they have been caught in the rain, when the *weather-glass* was above *changeable*: expecting that the *glass* should indicate the weather, with the same precision, that a clock or a watch shows the time of the day.

But this is somewhat unreasonable: it would, indeed, be equally philosophical to quarrel with the scales, when the guinea is under weight. It is quarrelling with the laws of nature, not with a glass tube and quicksilver.

All that the barometer pretends to is, to ascertain the WEIGHT OF THE ATMOSPHERE; which it does with great delicacy and

and accuracy : it is beyond the power of *mechanism* to form so fine a balance.

To the improper tables of the Jews, and *other* makers (who ought to have judged better), we must ascribe those disappointments which have brought their instrument into undeserved disrepute. If instead of *fair*, *rain*, and *changeable*, they had substituted *heavy*, *light*, and *medium*, or merely a scale of degrees, the barometer would have been considered, what it really is, a balance for ascertaining the weight of the atmosphere ; not, what it never was or can be, *in itself*, an infallible prognosticator of the weather.

In a former work *, I digested my ideas on this subject, fully, and circumspectly. It is now more than seven years since that work was written ; during which period I have continued to pay, in the summer months of almost every year, strict attention to the weather. My success has been *almost uniform* ; much beyond any thing my expectation could have suggested.

My THEORY and PRACTICE still remain unchanged. The SETTING SUN and the

BARO-

* EXPERIMENTS and OBSERVATIONS concerning AGRICULTURE and the WEATHER.

BAROMETER, taken *jointly, not separately*, have been my *chief* dependance: other APPEARANCES, the WIND, and the HEAT of the atmosphere have, in doubtful cases, lent their assistance.

What I mean to say further on the subject, at present, is, to recommend to every man, concerned in matters of husbandry, to pay due attention to the weather. I know from my own experience (even though I may have been in some degree *fortunate*), that much may be saved by it.

He must not, however, expect that a foreknowledge of the weather is readily learnt: like holding the plow, and judging the quality of stock, it requires considerable PRACTICE.

In haytime and harvest, let him give an eye to atmospherical appearances, and attend to the setting sun, as a *business* of the first importance; and let him consider his barometer, as a *useful implement of husbandry*.

In the course of a few summers, he will find himself enabled to foresee the weather, with the same kind of PRACTICAL KNOWLEDGE, as that which tells him what hay is fit for the stack, and which bullock will pay best for grazing.

The

The PROGRESS OF SPRING, 1787, at
Pickei ng, Yorkshire.

The grofsberry foliated,—10 March.

The fallow in full blow,—5 April.

One fwallow, near water,—12 April.

The Hawthorn foliated,—18 April.

Swallows about houfes,—27 April.

Cuckow firft heard,—6 May.

Swifts,—12 May.

Oak foliated,—29 May.

Hawthorn blowed, 10 June.

Afh foliated,—11 June.

During May, cold pinching winds ; and,
in the beginning of June, a very fmart froft.

QUERY, Do thefe circumftances account
for the unufual difference in the time of
foliation of the oak and the afh, and the
blowing of the hawthorn ; which, in a com-
mon year, happen within a few days of each
other ? The roots of the oak lie low ; thofe
of the afh and hawthorn, superficially.

In June, heavy rains fet in ; and continu-
ed, almoft without intermiffion, until De-
cember. So wet a fummer has feldom—per-
haps fcarcely ever—happened. Hay, in gene-
ral, was fpoilt ; and thoufands of acres of
corn were little lefs than wafte in the field !
a circumftance, perhaps, entirely new in the
annals

annals of husbandry. I never before knew a season, which did not afford a time (to those who had patience to wait for it,) for harvesting hay and corn, in *tolerable* condition. But this year, the late-ripe crops upon the Wolds, the Northern Heights, and in the Morelands, were, *inevitably*, little less than lost. During the latter harvest there were not, I believe, two fair days together, until near Christmas! the corn, which was carried, was of course spoilt, in the stack or mow. Hogs were bought up, and turned loose among the sheaves in the field! *

Another remarkable circumstance of this season was the extraordinary STRENGTH OF VEGETATION; which was equally manifest in the garden and the field. Every thing was *out of size*: Some plants entirely disfigured. Pasture grounds overrun with stale grass. In some stinted pastures (grounds let out annually in cowgaits to a fixed number of cows) scarcely half the grass was eaten.

These extraordinary exertions of vegetation are, perhaps, to be accounted for, in a succession of dry summers, terminating in a moist

* Yorkshire was not singular, in this disaster. All the Northern counties, I believe, shared a similar fate.

moist one. The soil, unable to exert itself during the dry seasons, became furnished with extraordinary powers; to which the moistness of this summer gave full scope.

7.

PLAN OF MANAGEMENT
OF
FARM S.

I. The HISTORY of FARM LANDS.
The husbandry of the Vale, like that of many other Districts, has undergone a total change by INCLOSURE.

Formerly, the entire margin, and much of the bottom of the Vale, lay in open COMMON FIELD; subject, from time immemorial, to the round of

Wheat, barley, or big.

Oats, beans, or other pulse.

Fallow.

Above these fields, were extensive COMMON SHEEP WALKS; below them, COMMON PASTURES,

TURES, for cattle and horses ; and COMMON MEADOWS, for hay.

Under this ancient system of management, the produce of the District was small ; the fields were unproductive, by incessant plowing, and for want of a change of crops ; and the meadows, by being mown, year after year, without remission, and without any other melioration, than what chance floods might partially afford them : while the pasture grounds, overrun with bushes and weeds, were equally unproductive. The principal part of the entire produce went to the maintenance of the oxen and horses, employed in the cultivation of the fields. Even the yeomanry, with all their industry and frugality, starved on their own estates, well soiled as many of them naturally were.

The Inclosures, which have taken place within the present century (see the Art. INCLOSURES) have not only changed the system of management, and increased the *neat* produce of the District, perhaps *threefold* ; but have inverted, in a remarkable manner, the *comparative* value of lands.

Formerly, the meadow lands were generally esteemed the most valuable part of a township : there have been instances of these lands,

cold-soiled, wet, distantly situated, and unproductive, being exchanged for common-field lands ; which, *at present*, being naturally well soiled, situated near a town, now inclosed, and laid down to grass, are of *five* times the value of the old grassland ; some of which still lies, in an intermixed unimproved state.

This is the most striking proof, I have met with, of much being to be done, *in some cases*, by a CHANGE OF GENERAL MANAGEMENT.

This extraordinary improvement has not been effected, by the mere circumstance of Inclosure ; but principally by that of changing OLD ARABLE LANDS TO GRASS, AND OLD PASTURE LANDS TO ARABLE. A change which seldom fails, if properly made, of being highly beneficial to the OCCUPIER ; and is frequently, as in this case, permanently beneficial to an ESTATE.

The *ancient* system of management being now nearly extinct,—and no circumstance of it, except the extreme industry and frugality with which it was conducted, being worth preservation,—I shall proceed to consider the Vale as an INCLOSED COUNTRY, and describe its PRESENT GENERAL MANAGEMENT : together with the various IMPROVEMENTS, which

which have been made in it, during the last twenty or thirty years.

II. The primary OBJECT of the Vale Husbandry is

BUTTER ;

put down into firkins ; the best of it for the London market ; the inferior sorts for the manufacturing towns of West Yorkshire.

Cows, barren, or in calf ;

OXEN, and some few younger cattle ; and

HORSES, principally for the saddle, — have long been staple productions of the Vale ; and are annually sent out of it, in considerable numbers, principally to the southern markets. Some

BULLOCKS, and great quantities of

SHEEP, are fatted, in the Vale and Morelands, for the ports of Whitby and Scarborough. Of late years,

BACON has been sent, in considerable quantity, into the West of Yorkshire, and some to the London market.

RABBITS are not a staple article, in the Vale, or on its margins, though some good warrens occur.

With respect to vegetable produce,

RAPE

may be considered as that which brings most

money into the country. Since the inclosure of common pastures great quantities of

OATS

have been sent out of the Vale. Also some smaller parcels of

BARLEY and

PULSE

have of late years been sent down the Derwent. But, notwithstanding the goodness of the soil, and its fitness for

WHEAT,

very little of this grain has been carried out of the neighbourhood of its growth ; having been wholly used in the home consumption. Of late years, however, there has been an overflow ; and Whitby has drawn part of its supply, from hence.

Besides these articles of MARKET PRODUCE, a variety of *subordinate crops* are raised ; as

GRASS, or NATURAL HERBAGE ;

CLOVER, and other CULTIVATED HERBAGE ;

TURNEPS, for cattle and sheep ;

POTATOES, for cattle and swine : also

FLAX (manufactured in the Vale) ;

TOBACCO.

III. The COURSE OF PRACTICE.

No regular succession, of arable crops and fallow, can be traced, in this District. Every man follows the dictates of his own judgment, and subjects his arable land to such uses, as are best suited to the general economy of his farm, in the given year.

This mode of management is not peculiar to the Vale under observation, but is common to other Districts, in which GRASSLAND predominates; under which circumstance, *aration* is considered as a secondary, and in most cases a *subordinate* branch of management.

When the sward becomes unproductive, it is delivered over to the plow, and the soil kept in an arable state, until another piece of sward begins to fail; when the former is laid down again to grass, and the latter broke up for arable.

In the Midland counties, where this alternacy of grass and corn has, in some instances, been in practice time immemorial, a regular course of husbandry has taken place. But, here, where this system of management is in its infancy, and where the diversity of soils is almost endless, no regular round of ma-

nagement can, with propriety, be at present pursued.

Land which has been kept in TILLAGE, century after century, is prone to grafs, and will *retain its sward*, much longer, than land which has been, only a few years, under the plow. And a RICH SOIL, COOLLY SITUATED, will *retain its sward*, much longer, than thin-soiled upland.

There are numberless instances, in which the richer cooler parts of the early inclosed common-field lands have now lain, more than *half a century*, in GRASS: nevertheless, the *sward*, though perhaps mown year after year, and treated with no extraordinary care, *still remains unimpaired*: the herbage well sorted, and the produce ample.

Therefore, to subject the lands of this District, circumstanced as they are, *at present*, to any METHODICAL ARRANGEMENT, OR REGULAR ROUND OF CROPS, would be an evident impropriety.

The only particular of the management of the Vale, in this respect, which appears to me censurable, is that of suffering *thin-soiled thirsty upland* to lie in a state of *sward*, perhaps as “meadow” (mowing ground,) when
it

it would, I apprehend, pay much better, in a course of ARABLE MANAGEMENT. Turneps, barley, wheat, and the cultivated grasses, equally affect it.

8.

S O I L S

AND THEIR

M A N A G E M E N T.

THIS COMPLEX subject requires, in the present instance, the following arrangement.

1. Species of soil.
2. Subsoils and underdraining.
3. Rough grounds and clearing.
4. Tillage.

I. SPECIES OF SOIL. The great diversity of soils, which the Vale and its environs afford, has been mentioned. Viewed in this light, it is a specimen of country which admits not, perhaps, of comparison. Within the narrow limits of a few miles, BARREN HEATH and LOW FEN LANDS are included; with

almost every intermediate soil: unproductive GRITSTONE LAND; thin stapled LIMESTONE LOAM; deeper and more productive "REDSTONE LAND*;" rich deep PEBBLY LOAM†; strong blue CLAY. And what renders this circumstance still more remarkable, there are instances in which the several species of soils, here enumerated, are included within the same farm.

A farm,

* RED-STONE LAND.—This singular species of soil is composed of loams, of different qualities, intermixed with a greater or less quantity of soft sandy stones, about the ordinary size of flints, and of a dark yellow or orange colour; a species of grit, or freestone. The cultivated soil is, in some instances, nearly half of it made up of these stones; which, some men are of opinion, afford, in themselves, a degree of nutriment to corn crops. An instance is mentioned (of this as of other stoney soils), in which a great quantity of these stones having been gathered off, as an incumbrance to the soil, its productiveness was much lowered; but the stones being returned, the soil also returned to its former state of fertility. Be this as it may, the soil under notice is, beyond dispute, one of the finest *corn* soils in the island.

† PEBBLY LOAM. This soil is noticed, as being the most *useful* soil, taken all in all, I have any where yet observed. It is equally productive of *corn* or *grass*; may be worked as *arable land*, in any season; and is found enough, in *grass*, to bear stock in winter. I particularize these soils, as they may, hereafter, with a variety of others, form a separate subject of investigation.

A farm, thus variously soiled, is a spur to ingenuity ; obliging its occupier to break through those confined opinions, and narrow prejudices, which are too frequently contracted, in countries where a UNIFORMITY OF SOIL, and a REGULAR ROUTINE OF MANAGEMENT, prevail.

This may account, in some measure, for the SPIRIT OF IMPROVEMENT, so conspicuous among the HUSBANDMEN of the country under survey.

II. SUBSOILS. The FEET and SIDES OF HILLS generally abound in LANDSPRINGS, and COLD WET SUBSOILS, caused by the waters, absorbed by the upper parts of the swells, lodging and striving for vent, in the lower regions.

From the cloud of hills which rise to the north of this Vale, it might be expected that a vein of cold land would be found on its margin ; but observation proves the contrary.

The waters of the Morelands find vent, in the dales and dingles with which they are intersected, and are entirely cut off from the Vale, by a deep valley, which lies between the moreland swells, and the range of limestone heights that form the immediate banks of the Vale ; while the heights, themselves,

selves, being in all human probability formed entirely of fissured rock, receive into their bosoms the waters which their soils absorb, and which sink below their bases, or rise in rocky fountains at their feet.

Near Pickering, the RIVER COSTA takes its rise ; not gushing forth, as from the mouth of a cavern, but rising, at numberless apertures, through a filter of sand, which has probably been brought out of the fissures of the rock ; the entire river, or rather river-like brook, rising within the compass of a few acres.

It is a fact worthy of attention, though perhaps easily to be accounted for, that a tract of country, containing about twenty square miles, lying above this efflux, has scarcely another SPRING belonging to it, nor scarcely a perch of SPRINGY SOIL upon its surface.

The limestone and redstone lands lie all on ROCK, above the level of this spring. The pebbly loam, which lies below it, is equally fortunate in a seam of GRAVEL, which, tho' it lie some feet beneath the surface, renders it sufficiently dry to be worked, at all seasons, and to carry stock, in winter, with impunity.

Under

Under these circumstances UNDER-DRAINING is rendered useless; and no instance of it occurs in this neighbourhood, except in the improved peatbog, which was mentioned under the article PLANTING; and which lies in the immediate vicinity of the source of the Costa; by whose waters, before the channel of the river was made, that bed of moor had been formed. The wetter parts of the area received considerable improvement from underdraining.

But altho' the substructure of the MARGIN is such as to preclude the use of underdraining, that of the *swells*, which rise in the BOTTOM OF THE VALE, renders this operation frequently necessary; and, in some few instances, it has been practised with great success.

In the instance which I most particularly attended to, thirty acres of cold unproductive land, lying on the skirt of one of those hillocks, was, by underdraining, improved to more than twice its former value. From a state of rushy ill grassed sward, it was raised, first to a piece of productive corn land, and is, now, a sound well herbageed grazing-ground. The MATERIALS, in this case, wood. No stones, in the neighbourhood.

In

In the MORELAND DALES, underdraining would, in many cases, be a valuable improvement; and, there, *stones* are abundant.

The *offal freestones*, which lie an incumbrance to the quarries of the margin, would pay well for carriage, into the bottom of the Vale.

III. THE RECLAIMING OF ROUGH GROUNDS. The inclosures of COMMONS and WASTE LANDS, which have of late years taken place, have directed the attention of husbandmen, toward the clearing and breaking up such lands, for the purposes of AGRICULTURE.

I. SODBURNING. The practice which has gained the greatest estimation is that of SODBURNING — provincially, “paring and burning:” — a practice which is little known in many parts of the island; but which ought to be well understood by every husbandman in it.

1. *Paring*. The bushes and other incumbrances of the surface being removed, the sward is inverted, with the breast plow, — provincially, “paring spade,” — in fods, about a foot wide, and three feet long.

The *judgment* requisite, in this stage of the process, lies chiefly in determining the proper

THICK-

THICKNESS of the fods. If they be pared too thick, they are difficult to burn; if too thin, the sward is not effectually destroyed, and the produce of ashes is too small. A rough spongy surface ought to be pared, thicker, than one which is firm and bare of grafs; and a light shallow soil ought to be pared, thinner, than one which is deeper and more tenacious. An inch may be considered as the medium thickness.

The *attention* required, in this part of the business, is principally to see that men, who work by the acre, break off the fods at proper lengths, and clear them effectually at their outer edges.

The *price* ten to twelve shillings an acre, varying principally with the freeness of the soil. Roots are detrimental, but stones are the greatest enemies, to the paring spade.

2. *Burning*. If the fods be naked, and the season moist, they are "set," on-edge, to dry; if grassy, and the weather be fine, this labor may, with propriety, be spared.

The *method* of burning is, invariably, in *small heaps* *, a rod or less asunder, according to

* For the greater conveniency of burning the fods, as well as of spreading the ashes.

to the quantity of sod ; but the way of *forming the heaps* is not fixed.

The bottom is generally made, in a round form, about a yard in diameter, with sods set on-edge. Some lay, on the windward side of this bottom, a bough of furze, or other kindling, with the brush end outward, covering it above with the grassiest and driest bits of sod ; and then make up the heap, in the form of a small haycock ; keeping the sods, on the inside, as hollow as may be ; but laying them flat and close, on the outside, to keep in the heat.

The heaps, made in this manner, are kindled, with a bough of lighted furze,—or, which is better, a link, made of tow dipped in tar, and wound round a small stake or other stick ;—the lighter running along the rows, from heap to heap, setting fire to the kindling.

Others, having formed the bottom, as above described, carry up the heap, with a *chimney*, in the middle ; kindling it with a shovelfull of live ashes, thrown down the chimney. When kindling materials are scarce, this may be the more eligible method.

When the sods are under-dry, much skill is requisite in forming the heap. The art lies,

lies, chiefly, in keeping it light and hollow within; and, whether it be made with an *eye*, or a *chimney*, in having due regard to the windward side. A little practice, and proper attention, will readily supply the rest.

If the heaps be made too large, at first, their own weight crushes them down, and destroys the necessary openness of the inner side; if too small, the fire, not being sufficiently confined, flies outward, and spends itself, prematurely.

The heaps well on fire, fresh sods are laid on, from time to time, until the whole are expended; not more than half of them, perhaps, being used in forming the original heaps.

In “beating up” the heaps, the fresh sods are laid upon the side, on which the fire is the strongest; the addition being seldom made, until the fire begin to make its appearance, on the outer side of the heap.

When all the fresh sods are expended, the unburnt pieces, which slide down the sides of the heaps and lie round their skirts, are laid upon the top, and the whole reduced to ashes, or at least exposed to the free action of the fire.

The

The burning is principally done, by women, by the day : sometimes the paring and burning are let together, by the acre. The *price of burning* five to six shillings an acre.

3. *Ashes.* The most general method, and that which seems to be in the best esteem, is to spread the ashes, as soon as they are cool, or perhaps while yet warm, and to plow the land, immediately, for the crop, with a *shallow furrow*, to prevent the ashes from being buried too deep in the soil.

Sometimes the soil is only *rice balked*, or half plowed,—not plowed clean.

Perhaps the most effectual method of mixing the ashes with the soil, the great thing to be desired, would be, first, to rice-balk, across the ridges ; and, then, to gather them up, with a clean plowing.

This summer has afforded me an opportunity of observing a singular INNOVATION, in the art of sodburning.

Instead of the fods being dried and burnt, and the ashes spread on the *pared surface*, and *plowed in*, under furrow, the land, in this instance, was plowed, immediately, as the paring was finished, the fods dried and burnt, and the ashes spread upon the *plowed surface*,

to

to be harrowed in with the seed, as a *top-dressing*.

In executing this method, the ridges of the lands were cleared, five or six feet wide, by throwing back the fods upon the sides of the lands; and, as the ground was plowed, the fods were returned to nearly their former situation; being thrown on, rough, over the plowed ground. One plow took about three women, at tenpence a day, to follow it. The extra *expence* half a crown to three shillings, an acre.

The *advantages* proposed, by this novel practice, are these: first, that of securing a burning season, with a degree of certainty, and without the expence of “setting” the fods; which being kept hollow, underneath, by the inequalities of the plowed surface, a free circulation of air is admitted, and the evil effect of regrowing to the ground, entirely prevented; and secondly, those of mixing the ashes more intimately and more evenly with the soil, and of preventing their being buried too deep, by the first plowing; which, in this instance, was necessarily given very deep, the soil being of a moory nature, and in a state too tender and moist to be plowed with a shallow furrow; which would

not have laid the surface sufficiently dry, for turneps,—the intended crop.

Therefore, in this case, the management was obviously judicious: and whether the advantages of FORWARDING THE DRYING, and of being able to use the ashes as a TOP-DRESSING, may not render the practice generally eligible, can be ascertained by experience, only.

4. The *time* of sodburning depends upon the *season* and the intended *crop*.

It is always unadvisable to pare in a *wet season*. The covering moist and feeble, and the sods soft with wet, fall heavy and flat to the ground. The grass soon rots; and if the season continue moist, the roots will, in a little time, regain a footing in the soil.

On the contrary, sods pared in *dry weather* fall light off the spade, and are kept hollow, underneath, by the grass or other covering, which, in a dry season, are rigid; bearing up the sods from the ground; thereby admitting a circulation of air beneath them. By this means, the extra expence and trouble of *setting* is avoided, and the process of cineration rendered much less difficult, and irksome.

The CROP, therefore, ought to be, in some measure, subservient to the SEASON.

5. The

5. *The crops* most in use, for sodburnt lands, are WHEAT, RAPE, TURNEPS, BIG, OATS. It is seldom, however, that a paring season can be got, early enough in the spring, for either of the latter crops; the last more especially. Big, however, is frequently sown on burnt land, the latter end of May, or the beginning of June, with success. RAPE and TURNEPS are the most general crops, and upon the whole, perhaps, are the most eligible: the month of June is a leisure time, and generally a good burning season. However, WHEAT, provided the land were fallowed, and the soil and ashes mixed together, by repeated plowings and harrowings, between the burning season and seedtime, does not appear to be an ineligible crop.

There have been instances, I am told, in which the ashes (having been spread in the middle of summer) were suffered to be grown over with grass; which being turned under in autumn, WHEAT has been sown on one plowing, with good success*.

GENERAL OBSERVATIONS. SODBURNING appears to be one of the sources of improvement,

U 2

* 1796. This is, in theory, a most eligible practice; and is entitled to full attention, on breaking up old rough grass lands.

ment, which, being yet imperfectly understood, require every effort of the farmer and the philosopher, to bring them nearer to perfection.

At present, the practice is confined to a few Districts : and in those it is applied to particular purposes, only : while the principal part of the kingdom is a stranger to its uses.

It does not appear to be considered, even in this District, as a GENERAL SOURCE OF MANURE ; but, merely, as being applicable to the reduction of *old tough sward*.

For even here, where it has long been in common practice among discerning husbandmen, there are men who still see it as a bugbear, too terrible to become familiar with. The false notion of “ sending the soil into the clouds,” frightens some ; while the better-founded idea of reducing it all to ashes—by too frequent repetition of this operation—is a stumbling block to others.

Whoever will attend to the quantity of earth in the fods, and the quantity of ashes produced from them, will lose his fears about the *soil* being *lessened* by this operation.

Supposing the fod to be an inch thick ; not more than one fourth of it, perhaps, is
soil ;

soil; and this, so far from being *reduced* in bulk, to an alarming degree, is perhaps *increased* in size, by the action of the fire; which, by leaving it, in an open porous state, renders it *more bulky*, than the same soil, shook from the sods and reduced to a perfect state of dryness only, would *probably* have been.

I will not contend for the *increase*, nor will I, at present, admit that the soil is *lessened*, by the operation. Different soils are acted upon in different ways, by fire: CLAY burns to *hard cinders*, of the nature of *brick*, remaining in the soil, *unaltered by time*; while the cinders of lighter soils are more perishable.

These effects of sodburning do not appear to have been attended to. Its use in reducing tough sward strikes every one; and its effect, as a manure, in the cases in which it is usually applied, is here clearly understood.

But its effect, in IMPROVING THE TEXTURE OF STRONG COHESIVE SOILS, has escaped general notice. Yet how could art devise an ingredient more likely to give openness, and freedom, to a closely textured soil, than rough, porous, unperishable ashes? a material of improvement which the soil itself supplies, free of cost. The *immediate* ac-

quisition of MANURE repays the expence of the operation. The more PERMANENT IMPROVEMENT of the CONTEXTURE of the SOIL is obtained, of course, without expence.

Viewed in this light, SODBURNING, whatever effects it may have, on light porous soils, is, in all human probability, a cardinal improvement of soils, of a CLOSE CLAYEY NATURE: and it appears to me a matter incumbent, on every possessor of such soils, to try, on a small scale at least, the effect of a FREQUENT REPETITION of this operation.

2. FURZE GROUNDS. It is the opinion of one, who has paid close attention to the subject, that *old furze grounds*, off which fuel having been repeatedly carried, are of course much depauperated, may be improved in the following manner.

Grub up; sow grass seeds, on the grubbed surface, without plowing; and let the land remain in this state, until it has acquired a degree of firmness, the smaller roots left in it are decayed, and the surface has got a covering. Then sodburn, lime, &c. and break up the soil, for a course of arable crops; closing with cultivated herbage. When the furzes begin again to grow troublesome, repeat the sodburning.

3. WOOD-

3. WOODLANDS. The same inventive husbandman has struck out a simple and certain method of freeing grass land from the SLOETHORN, — one of the hardiest *shrubs* which husbandry has to contend with.

If black thorns be *grubbed up by the roots*, every fibril, left in the soil, produces a fresh plant ; so that, instead of being lessened, by this tedious and expensive operation, their number is encreased.

If they be *felled, aboveground*, the stubs are in the way of the sith, and the bite of cattle ; and the thicket is presently renewed.

But if they be CUT OFF LEVEL WITH THE SURFACE (or somewhat beneath it), the sith has free sweep, and the young shoots are of course removed, with ease and certainty.

If the ground be mown for hay, the same stroke, which cuts the herbage, takes off the ligneous shoots.

If pastured, cattle and sheep, provided they have no *woodland* left to brouze among, will gnaw them to the quick ; scarcely leaving a stem or a stump remaining. It is, however, always adviseable, in *this* case, to sweep the ground over with the sith, in the course of the summer season ; to remove, effectually,

the remains which may have escaped the bite of the pasturing stock.

The second year, the *shoots* rise weak ; and the *roots*, themselves, seldom survive the third year. In a very few years more, the roots are found entirely rotten ; thus becoming a source of nutriment to the crop, instead of remaining a nuisance.

If a thicket, or a border, whose *sward* is nearly lost, be treated in this manner, rubbish of every kind should be raked off, a few GRASS SEEDS scattered on, and the surface run over with a roller, as a preparation for the sward.

This mode of extirpation is not applicable to the SLOETHORN, only ; but to the OAK, the ASH, the HAWTHORN, the MAPLE, and every other tree and shrub, to which it has been applied, — the FURZE and the BRAMBLE excepted.

GEN. OBSERVATIONS ON RECLAIMING FOREST LANDS. It is, I believe, a universal practice, when WOODLAND is given up to HUSBANDRY, to take up *all the roots*, large or small, at an expence, perhaps, equal to half the value of the land ; which, in this case, is subjected immediately to the *plow* : altogether, the most rugged operation, which husbandry is acquainted with.

But

But how much more eligible would it be, to treat such land, in the manner above described? keeping it in a state of GRASS, until the *roots were decayed*, and rendered obedient to the share.

The sums of money (one might say the fortunes), which have lately been expended, in the IMPROVEMENT OF ENFIELD CHACE, are too well known; and will, it is to be feared, throw a damp on the further improvement of the ROYAL WASTES: a concern of some importance to these kingdoms.

But how easily, and with what certainty, might these wastes be improved? The wood, upon most of them, is doubly sufficient to make the necessary improvement.

Take down the TIMBER TREES, and the POLLARDS, by grub-felling, in the Norfolk manner: remove such of the LARGER ROOTS as will pay amply for removing; and fill up the holes, with the cores of ant-hill, or other protuberances, with which these wastes generally abound; sowing grass seeds on the surface.

Treat the UNDERWOOD, and other BRUSH WOOD in the manner above described; and reduce the whole to a state of GRASS; keeping it carefully swept with the spithe, until
the

the REMAINING ROOTS be SUFFICIENTLY DECAYED.

Then, *but not before*, bring the soil under a course of ARABLE MANAGEMENT.

The fencing, the castration of ant-hills *, and perhaps doing away a few other roughnesses, would be the only labor requisite, which would not more than repay itself †.

The ROOTS, instead of being a principal cause of EXPENCE and ANXIETY, would, under this management, become a source of IMPROVEMENT OF THE SOIL; while the EXPENCE, of bringing the soil under a course of ARABLE MANAGEMENT, would be in a manner precluded, by having a *free grassy surface*, suitable to the purpose of SOD-BURNING.

This township (part of the ancient forest of Pickering) affords at present (August 1787) numberless instances of the great UTILITY of SOD-BURNING MAIDEN SWARD.

In adjoining allotments (see the Art. INCLOSURES) without a shade of difference, as to soil or situation, the crop, after sodburning, is, in some instances, *fourfold* that of the crop, sown

* See NORF. ECON. MIN. 50.

† If DRAINING be found requisite, how suitable is the opportunity, while land remains in grass.

sown on one plowing of the natural sward; and this notwithstanding the favorableness of the present summer, towards the latter process. Had the season proved *dry*, oats sown on one plowing of the *thinner soils*, must have perished; or, at best, must have remained in a dwarfish unharvestable state. There are oats, even this year, not six inches high; and others, too weak and straggling to ripen as a crop, have been swept down with the *fithe*, and raked together, as fodder.

It is observable, however, that, on the *deeper soils*, there are, this year, some fine crops of oats, on the natural sward.

The cause of this disparity, between the produce of deep and shallow soils, is obvious. The surface of soils which have remained, from century to century, in a state of SWARD, is, in a manner wholly, occupied by the roots of grasses and other plants; forming a *tough mat of fibres*; reaching, in some cases, several inches deep; especially over a cold moist subsoil; where the sedgey tribe are frequently in full possession.

If the SOIL be THIN, it is *wholly occupied by roots*: the plits, or plow slices, afford *no loose mold*, for covering the seed; which either lies exposed on the surface, or falls through

through the seams, upon an infertile subsoil, and among grass, still perhaps in a growing state. The few grains, which happen to get buried in the mold, flourish, while their own substance lasts; but the kernel once exhausted, the rootlings look out, in vain, for other sustenance; the soil is already occupied, by veteran roots, too powerful for the infant fibrils to contend with.

But, if the SOIL be DEEPER THAN THE SWARD, the seeds get properly covered, and the young plants have fresh mold to strike root in; and to support them, until the sward die, decay, and afford nourishment to the rising crop.

The USES OF SODBURNING, *thick-swarded soils*, are those of effectually *killing the sward*; doing away the *toughness of the plits*, and furnishing, in the ashes, a supply of acceptable *pabulum* to the infant plants.

Out of this statement of effects result these general conclusions.

RICH, DEEP SOILS, though covered with old sward, may be sown with corn, on ONE PLOWING.

It is reasonable, however, that this plowing should be given, some time before the seed be sown; for the double purpose of exposing

posing the inverted plow slices to the meliorating influence of the sun and air, from which they may have long been estranged ; and of FORWARDING THE DIGESTION OF THE SWARD.

It is likewise observable, that, in this case, a DOUBLE PLOWING (burying the sod at the bottom of the furrow) is obviously preferable to a single one.

But SHALLOW, LESS FERTILE SOILS will not bear this treatment : they require either to be SODBURNT, or FALLOWED, to reduce the sward and meliorate the soil.

But fallowing is expensive, loses, *unnecessarily*, one year's crop, and does not change the texture of COHESIVE SOIL ; to which, whether deep or shallow, sodburning appears to be singularly well adapted.

The length of these reflections will, I trust, find an excuse, in the magnitude of the subject which gives rise to them. The ROYAL FORESTS, and numberless PAROCHIAL WASTES, afford at present little benefit to the community ; but are capable of affording great national advantage. To endeavour to forward their improvement, by pointing out the easiest method of accomplishing it, is, therefore, the duty of every man, whose experience

experience has led him to reflections on the subject.

Improvements, thus conducted, would be progressive and pleasurable; requiring no extraordinary share, either of attention or capital.

IV. TILLAGE. In a country in which GRASS LAND is the PRIMARY OBJECT, excellency in the minutiae of the ARABLE PROCESSES must not be expected: nevertheless, where the invention is let loose, and a spirit of improvement prevails, we may hope to find some SPECIAL MATTER worthy of notice.

The only particulars, which appear to me noticeable, in this place, are,

1. Plowing with reins,
2. Laying lands across slopes.

I. PLOWING WITH REINS. In this respect, the husbandmen of the Vale excel. Various as are their soils, they plow them, invariably, with TWO HORSES, driven and guided with REINS; which at once answer the purpose of *guiding* and *driving*: thus far exceeding the less handy line, and the hand whip of Norfolk *!

Proper

* See NORFOLK; Section IMPLEMENTS.

Proper *seasons* for the operation are endeavored to be caught ; but, even with this advantage, it is matter of astonishment, how some of their strong deep soils are turned, by a pair of light slender horses ; which, in a balance, would barely outweigh one of the four (or perhaps six) which are used upon the hills of Surrey and Kent, in plowing soils of less tenacity !

In Norfolk, the soil is light, and the great merit of the Norfolk husbandmen lies in their expedition. Here, where the custom is to go only *one journey*, the quantity plowed, in a day, is much less than in Norfolk ; but generally more, even in the stronger soils, than is done by two men and four expensive horses, in many other places.

It has been a generally received idea, even among men who think liberally, and are inclined to think well of the practice of plowing with a pair of horses, that it is only applicable to LIGHT THIN SOILS. But the established husbandry of this country proves that idea to be erroneous.

It strikes me, however, advocate as I am for the practice, that, in some cases, especially where the soil is DEEP AND TENDER, three horses, at length, would be preferable.

But

But the plea held out against this management is, “ We cannot afford it” ! The truth is, land here has got up to the TWO-HORSE-
FLOW PRICE ; and tenants seem to be aware, that they cannot pay their rents, if they send more than two horses and one man to plow. What a strong recommendation is this of the practice.

2. LAYING LANDS ACROSS THE SLOPES OF HILLS. The general practice, unless where the turnwrest plow is in use, is to plow the sides of hills, *up-and-down*, laying the lands parallel with the line of descent, not obliquely across it *.

Where the SUBSOIL is *absorbent*, this is perhaps the most eligible method ; the rain-water which falls on the land being, by this means, effectually prevented from making its escape, off the side of the hill. For, unless *ridges* be raised very high, the water, in this case, has no propensity toward the furrows, on either side ; its tendency, when the *lands* lie flat, being down lines lying parallel between them : consequently, the rain water, which falls upon them, may run from the top to the bottom of the hill, without finding its

* But see the WEST OF ENGLAND ;—Section WHEAT.

its way into the *interfurrows*; which, in this case, are rendered *entirely useless*; as SURFACE DRAINS.

This circumstance renders the common method of plowing the sides of hills altogether ineligible, where the SUBSOIL is *cold* and *retentive*; and where the SURFACE WATER is of course required to be got rid of, the *quickest* and *shortest* way.

To this end, the lands are thrown ACROSS THE SLOPE, *nearly* parallel with the horizon, merely giving *sufficient descent*, for water to find its way along the interfurrows.

The EFFECT of laying the lands in this direction is evident: the rain water, which falls upon them, has never farther to run, than the width of the bed it falls on; (even supposing it to fall on the upper edge) for so soon as it is caught by an interfurrow, the vegetable pasture is relieved from it.

Hence, the narrower the lands, provided the interfurrows be sufficiently deep, the more immediate the effect.

The only INCONVENIENCY, of laying lands across the slope, is that of having the *plits*, on the lower sides of the lands, *to turn against the hill*; an operation which requires a good workman to do it properly.

But there is an ADVANTAGE, in this method, which more than overbalances that inconveniency. The PULL is always upon, or nearly upon, LEVEL GROUND ; whereas, in the common direction of the lands, the uphill pull is intolerable to the beasts of draught, especially to horses ; which, through fear or impatience, draw by jerks, eager to reach the top of the hill ; thereby fatiguing themselves and the plowman, unnecessarily, and rendering the work defective.

The good effect of laying lands across slopes, is not only plausible, in theory, but is verified, by practice. I have seen an instance, in which land, which had heretofore been cold and poachy, improved, merely by changing the direction of the ridges, to DRY, SOUND, PRODUCTIVE soil, worth nearly twice the rent, it was, before this simple alteration took place.

MANURES

9.

M A N U R E S

AND THEIR

M A N A G E M E N T.

THE SPECIES OF MANURE that are used in the District are,

1. Ashes.	3. Lime.
2. Marl.	4. Dung.

I. ASHES are used, chiefly, in the MORELANDS, where great quantities of turf and peat are burnt upon the hearth, for the double purpose of FUEL and MANURE ; the ashes being considered, as equivalent to the expence of collecting the materials.

II. MARL. This is not found, in quantity, *as a fossil*, either in the Vale or the Morelands. The only marl, which has been used as a manure, is a produce of *petrification*. This marl, and the fountain from whence it flows, are noticeable.

The waters of "NEWTON-DALE-WELL" have long been celebrated, for their virtues in cold-bathing; and, for strengthening the limbs of children, they are, I believe, celebrated justly. An anniversary, relative to these waters, has been observed, time immemorial; and is still observed, by the neighbouring youth, who meet at this spring, upon some certain Sunday in the summer months, to bathe; and—a poetic mind would add,—to celebrate the virtues of the water.

The situation of this spring is singularly wild and romantic: the country, on every side, mountainous and barren, excepting the narrow dale, or cultivated chasm, near the head of which the spring is situated.

At the time these mountains and this chasm were formed, the water, it is probable, gushed out of the face of a perpendicular rock, which now rises about eighty feet above the spring; but, through the mouldering of the rock, and the accumulative effect of the waters, the base of the precipice, out of which they issue, now reaches, with a sharp ascent, to near the mouth of the spring.

The upper part of the slope, at least, has evidently been raised, by VEGETATION and PETRIFICATION. Had not the hand of art
been

been assisting in removing, from time to time, the accumulated matter, in the form of "marl" and "limestone," and in leading the water by a channel from the rock, the spring might, long since, by overgrowing its mouth, have been the cause of its own extinction.

These waters, at their source, are remarkably cold, and strongly CHALYBEATE to the taste, tinging their bed of a deep rust color; but, as they fall down the base of the hill, they lose, by degrees, their chalybeate qualities; losing them, entirely, before they reach the foot of the slope.

What is equally observable, their PETRIFACTIVE quality is, at the source, barely perceptible, and does not acquire its full effect, until they have run some twenty or thirty yards down the slope; about which point, they lose, almost entirely, their chalybeate *taste*; though they still continue to *tinge* the channel; the color growing fainter, as the length of channel increases*.

Where the rill meets with no vegetable matter, to petrify (or rather to *incrust*), it

X 3

forms

* This spring, which is at least an object of curiosity, and whose waters may contain medical virtues which require to be pointed out, is situated about two miles from *Saltergait-inn*, on the road between PICKERING and WHITBY.

forms an INCRUSTATION, at the bottom of its channel ; which, in time, being filled to the brim, the waters overflow, spread over the slope, and incrust every thing which falls in their way ; until having found some hollow channel (or perhaps in a state of nature having reached the face of the rock), they form a fresh rill ; which being annihilated, in the same manner, the waters proceed, and return, along the face of the slope ; thus forming, in an undisturbed state, a natural semi-cone.

Where the surface has been free from moss, or other vegetable production, the accumulated matter is WHOLLY CALCAREOUS ; of a light colour, resembling the MARL OF NORFOLK ; except in its being discoloured, more or less, with a chalybeate tinge. Where moss, liverwort, and other vegetables have been incrustated, a STONE-LIKE SUBSTANCE is formed : the former is called “marl,”—the latter “stone.”

At present, the face of the slope is hollowed out, into great irregularity, by digging for, and carrying away the *marl* ; leaving masses of *stone*, some of them containing many cubical feet, standing above the present surface,

These

These stones, though light, being full of hollowneſſes within—mere bundles of moſs and algæ—have, by being long expoſed on the ſurface, acquired a very great degree of hardneſs ; their ſmalleſt aſperities being with difficulty broken off.

By immerging the fragments in the marine acid, weakly diluted, the calcareous incruſtation is leiſurely diſſolved ; leaving the vegetable matter, entire, and, to appearance, as perfect as when it was firſt incruſted ; tho' it may have lain, locked up in that ſtate, a thouſand, or many thouſand years.

These *vegetable ſtones*, likewise, have been carried away, and burnt as LIMESTONE. The quantity of *lime*, however, produced from them could not be great ; but mixed with the *aſhes* of the vegetables, a valuable manure may nevertheleſs be formed.

In a ſituation ſo recluſe, it is no wonder this valuable ſource of manure ſhould have been, in ſome degree, neglected. The bottom of the dale which winds below it, does not appear to have been much benefited, either by the waters, themſelves, or the matter which they have formed. The principal part, of that which has been taken away, has been carried, up a winding road, over the top

of the mountain, to a neighbouring dale (Goadland) some three or four miles distant.

Over and above the difficulty and expence of carriage, a shilling a load has been paid, to the lessee of the royalty, for these calcareous substances; not for the purpose of experiment, but in pursuance of established practice; a sufficient evidence, this, of their virtue as a MANURE.

III. LIME. This is, at present, a favorite Manure, in the Vale. It is used invariably, I believe, on every species of soil, and *in most cases* with great success. It seems to be, at present, a received idea, that the business of aration could not be carried on, or at least that the present rents of land could not be paid, without the assistance of lime.

It is not my intention to attempt to prove, or disprove, the truth of this opinion. Suffice it for me to say, in this place, that I am not acquainted with any country, in which lime is held in such high repute, nor where the manufacturing of it is so common a practice among farmers, as it is in this. Almost every principal farmer, upon the margin, burns his own lime.

There are, besides, great number of "fale kilns" for smaller farmers, and for the centre
of

of the Vale, where no materials for burning are to be had. There is an instance of one man occupying eight or ten kilns; burning two or three thousand chaldrons, yearly.

The LIME HUSBANDRY of this District, therefore, merits particular notice. The subject requires the following division:

1. The materials burnt.
2. The method of burning.
3. The cost, and the selling price.
4. The soils, and the crops to which it is applied.
5. The method of applying.

I. MATERIALS. On the NORTHERN MARGIN of the Vale, lime is burnt solely from *stones*, of different colours and textures. The species most prevalent are—a strong grey LIMESTONE GRANITE; and a species of blue and white MARBLE, the blocks, whether large or small, being blue at the core, and lighter-coloured toward the outer surface.

One hundred grains of the former, taken from a lower stratum of PICKERING-CASTLE-BANK, yield fortythree grains of air, and ninetyfour grains of calcareous earth, leaving a residuum of six grains; chiefly a brown silt, with a few gypsum-like fragments.

One

One hundred grains of the latter, taken from the lower stratum of a quarry, near KIRBYMOORSIDE, afford thirtynine grains of air, eightyfix and a half grains of dissoluble matter; and thirteen and a half grains of residuum, fine impalpable silt.

The lime, produced from the former, is of a dusky colour, and falls in rough coarse GRAINS *; that, of the latter, bursts into a white volatile flour-like POWDER.

The stones of different quarries are different in quality, but none of them differ widely from the specimens above described.

On the SOUTHERN HEIGHTS, the prevailing material is a singular species of SOFT CALCAREOUS GRANITE. Its colour a dirty white: its contexture resembling the grains of white mustard-seed, or the roe of fish, run together with a cement of chalk or marl †. The hardness of this *stone* (if it merit the name) increases with the depth of the quarry. The lower blocks are used in building; but the upper stratum, for three or four feet below the soil, is generally a STONE MARL of

* Each grain being composed of a series of eggshaped shells, inclosed within each other.

† Resembling, in contexture, the lime of the Pickering stone.

of no mean quality, but varies in different quarries. I have not learnt, however, that in any instance it has been applied as a MANURE. On the contrary, it appears to be universally cast, as an incumbrance, to the bottom of the quarry *.

One hundred grains of the MALTON STONE, taken from the middle of the quarry opposite the Lodge at New Malton, yield fortyfour grains of air, and ninetyseven grains of calcareous earth, leaving three grains of residuum, chiefly a brown silt.

But the stones of different quarries vary in quality. One hundred grains, taken from a newly opened quarry, by the side of the road

* On this side of the Vale, too, the limestone rubble which lies between the soil and the rock, is much of it of the nature of MARL, and might in many cases be applied, as such, with advantage. Its effect, where it has been thrown back from the edges of the quarries on Scallowmoor (a light loam inclining to a black moory soil) above Pickering, is striking. The earth of this rubble is strongly calcareous, and its stones are frequently covered with a white efflorescence, which is purely calcareous. Great quantities of it might be collected; and where a fit soil can be found (by trying experiments with it on a small scale) in the neighbourhood of a quarry, it would, in all probability, pay amply for setting on. For the bottoming of farmyards and dunghills, the entire "coping," the soil inclusive, would be found excellent.

road leading from Malton to Castle Howard, yield only ninetyfour grains of dissoluble matter.

I mention this circumstance, as the plot of ground, in which this quarry is dug, was bought, it seems, at an extravagant price, for the purpose of burning lime; but the lime, *it is said*, proving of an inferior quality, a principal part of the money will be sunk. This shews the great use of analysis, in ascertaining, without hazard, a knowledge of the qualities of limestones*.

One hundred grains of WOLD CHALK, taken from a lime quarry near DRIFFIELD, yield fortyfour grains of air; three and a half grains of a soft mucilaginous residuum; and ninetyfix and a half grains of calcareous matter†.

2. BURNING.

* In this case, however, if the specimen, I happened to take, was a fair one, the bad quality of the lime cannot be altogether owing to the stone; which, by this analysis, is far from being a bad one, though inferior to that of the preceding experiment.

† In these experiments the quantity of CALCAREOUS MATTER is *inferred* from the quantity of RESIDUUM, no more of it being precipitated, than a sufficiency to shew its colour; which, in every case, was of *snowy whiteness*; a principal evidence of its being a *pure* calcareous earth. The quantity of AIR and the quantity of RESIDUUM were, in each experiment, closely attended to.

2. BURNING. In giving the detail of this operation, the following subdivisions will be requisite :

1. Building the kiln.
2. Raising and breaking the stones.
3. Coals and their proportion.
4. Filling the kiln.
5. Drawing the kiln.

1. *The kiln.* The materials are either limestone, entirely, or limestone, lined with bricks on the inside. Neither timber, nor mortar, is here used, in building a lime kiln; the former presently decays, and the latter, by alternately swelling and shrinking, bursts the walls; besides rendering them, in the first instance, too tight to admit a proper quantity of air : no other air holes, than the “eyes” at which they are kindled, being made in the kilns of this district *.

The *form* of the cavity is an irregular cone inverted. At the bottom, are generally two eyes, opposite to each other; the cavity being here contracted to a thin point, or narrow trough; the width that of the eyes. As the walls are carried up, the cavity takes, by degrees,

* 1796. In some Districts, where tight walls are in use, small air holes are left to give the requisite supply. See MID. ECON. Min. 2.

grees, a circular, or sometimes an *oval* line; at the same time receiving, as it rises, a *conical* form; until, having reached somewhat more than half its intended height, the form is changed to *cylindrical*; or is sometimes *contracted* towards the top. The proportion, between the depths and the diameters of these kilns, is that of the depth; being, generally, about one and a half diameter of the top.

The *size* varies from six to forty chaldrons.

2. *The stones.* The art of *raising* stones can only be learned by experience, in the given quarry in which they are to be raised. They are sometimes raised by the day; sometimes by the load; but, most generally, the entire labor of burning is taken, together, at so much a chaldron of lime.

The *breaking*, of hard strong stones, is a laborious part of the operation of limeburning. On the north side of the Vale, it is done, by men, with large sledge hammers; but, on the Malton side, where the stone is soft, women are frequently employed in breaking.

The medium *size* is that of the two hands; but men, burning by the chaldron, will not, unless well attended to, break them so small: stones, nearly as big as the head, are sometimes,

times, but very improperly, thrown into the kiln; for unless the proportion of coals be unnecessarily large, the surface, only, is burnt to lime, the core remaining a lump of unburnt stone.

3. *Coals.* The Morelands, for the last fifty years, have furnished the north side of the Vale with coals, for burning lime, and for an inferior species of fuel. The seam of this coal is thin, and the quality, in general, very ordinary.

Before the discovery of these coals, lime was burnt with furze, and other brushwood; but notwithstanding the Morelands are, now, nearly exhausted of coals (unless some fresh discovery should be made), the District is relieved from the apprehension of returning, again, to its ancient mode of burning lime. The Derwent, beside an ample supply of coals for fuel, brings an inferior kind (both of them raised in West Yorkshire) for the purpose of limeburning. The eastern end of the Vale is equally fortunate, in this respect, by having the port of Scarborough in its neighbourhood. And see *INL. NAV.* p. 15.

The *proportion* of coals and stones varies with the quality of the coals, and likewise, but in a less degree, with the quality of the stone :

stone: the method of burning, too, varies the proportion. *Three chaldrons of lime from one of coals* (the measures equal) may be considered as the mean produce. From two and a half to three and a half for one, includes the whole extent of produce of well burnt lime.

4. *Filling.* Some kindling being used at the eyes, and an extraordinary proportion of coals at the bottom of the kiln, it is filled up with stones and coals, in thin alternate layers; those of stones being five or six inches thick; with coals in proportion; the coals, if not sufficiently small, being previously reduced to a gravel-like state; in order to run down, more freely, between the interstices of the stones, and thereby to mix, more evenly, with them.

The materials are cast into the kiln, with large scuttles, or shallow baskets; which are filled with stones, by means of an iron-toothed rake, composed of four teeth, about six inches long, of a head about a foot long, and of a handle about four feet long.

If several men be employed, in filling a kiln, it is common for each man to fill and empty his own scuttle. But this is an uncertain, and therefore an improper, way of proceeding.

ceding. Much depends on the regularity and evenness of the layer, and the due proportion of coals; and to judge of this, with sufficient accuracy, requires some experience, and a steady eye; especially when the kiln is on fire, and the cavity to be filled up is obscured by smoke. If more than one person be employed, in this case, it is highly probable the work will be imperfectly done.

Among the sale kilns, about Malton, there is an excellent regulation, in this respect. The scuttles are all filled, and brought to the top of the kiln, by WOMEN and BOYS, who deliver them to the MASTER, or his foreman, standing there to receive them, *with his eye fixt within the kiln*; by which means he is enabled to distribute the stones and coals, with the greatest accuracy.

5. *Drawing*. There are two species of kilns; or rather one species used in two different ways.

A kiln which is filled, fired, and suffered to burn out, before any of its contents be drawn, is called a "STANDING KILN."

If the contents be drawn out, at the bottom, while the upper part is yet on fire,—the vacancy at the top being repeatedly filled up with stone and coal, as the lime is ex-

tracted at the bottom,—the kiln is termed a
 “DRAW KILN.”

Since coals have been used in the burning of lime, draw kilns have, until of late years, been most prevalent. But, at present, standing kilns are most in use.

The reasons given, for this change of practice, are these: first, that the lime is burnt, *evenner*, in standing than in draw kilns; in the drawing of which, the stones are liable to hang, round the sides of the kiln; those in the middle running down, in the form of a tunnel; thereby mixing the raw with the half-burnt stones. The consequence is, the outside stones are burnt too much, the inside ones too little; the stones, too frequently, running down to the eye, in a half-burnt state. Secondly, the unevenness of surface, left by this method, together with the obscurity caused by the smoke, render the *filling difficult*; under-burnt stones, or an unnecessary waste of coals, is the inevitable consequence. A third argument in favor of standing kilns is, that a *greater proportion* of well burnt lime may be produced, from the same quantity of coals. It is allowed that more kindling fuel is requisite; and, at the bottom, a greater proportion of coals; but the

the fire, by this means, getting a strong head, a less proportion of coals is required, in the body of the kiln; and what, perhaps, is of still more consequence, less heat is lost at the top of this; than of the draw kiln; which is always uncovered, and too frequently hollow and full of cracks; while the top of the standing kiln, being piled up in a conical form, and closely covered with sods or rubbish, collects a greater body of fire, and keeps in the heat more effectually.

One circumstance, however, relative to the standing kiln, requires to be mentioned: The inside should be *lined with brick*. For every time a kiln, which is lined with limestone, is suffered to go out; a shell of lime peels off the inside; by which means the walls are soon impaired.

The lime is *drawn* out at the "eyes," with a shovel, and generally carried out in scuttles, or in basket measures, to the cart or waggon.

Of a living kiln, the drawing is generally continued, until red ashes begin to make their appearance. But standing kilns are suffered to burn undisturbed, until the fire goes out; except, perhaps, when the fire is rising toward the top, and a fresh supply of air is

wanted, a few shovelfulls are drawn at either eye, by which means a degree of hollowness is formed, and fresh vigour given to the fire.

From these circumstances, it is plain, that a regular supply of lime cannot be had, from less than three standing kilns: one filling; one burning; one drawing. The smaller burners, however, have frequently only two; and, for a farmer, one, proportioned to his farm, is sufficient*.

3. COST and PRICE. The ordinary wages for the whole labor of raising, breaking, filling, and drawing, is 18d. to 20d. a chaldron.

At MALTON, the *labor*, if taken by the gross, is about 18d. The price of "lime-kiln

* About Bretherton and Nottingham, near FERRYBRIDGE, from whence immense quantities of lime are sent; to distant parts of the Vale of York; particularly toward Easingwood; the kilns are very *shallow* and *wide*; the cone of materials piled above the surface, being, to appearance, equal to the contents of the kiln. This renders the emptying of the kiln very easy; the lime being all thrown from the surface, or through a kind of door-way in the side; not drawn out of the eyes; which are in this case, of no other use than to kindle at, and to admit a supply of air. Those kilns are much less expensive than the kilns of *this* District; and more convenient. But query, Do they give as much heat, with the same quantity of coals, as a taller more cylindrical kiln?

kiln" *coals*, with carriage from the keels to the kiln, about 14s. a chaldron (of thirtytwo bushels) the *produce*, better than *three for one*. The whole *cost* about 6s. the *selling price* 7s. a chaldron.

At PICKERING, the *labor* is 2cd. a chaldron: the price of "moor coals" and carriage 16s. of "Malton coals" and carriage, 18s. The *produce*, if sufficiently burnt, *three for one*. The mean *cost* is therefore about 7s. 6d. the *selling price* 8s. a chaldron. The building and repair of kilns; the wear of tools; the value of the stone in the quarry; and, in some cases, the carriage of it from thence to the kiln, are drawbacks upon the profits, which appear in the above calculations. If therefore the stones be *sufficiently burnt*, the neat profit is, in this case, very small *.

Y 3

4. APPLI-

* Nothing, perhaps, would encrease the profits of lime-burning, in *this* place, more, than the kiln being filled by the hand of the master, or some judicious person, not interested in a waste of coals. It is the interest of men, who burn by the chaldron, to underbreak the stones, and to make up the deficiency of labor with an increase of coals; which, likewise, will make up for neglect, or want of judgment, in filling. Let the stones be raised and broken by the chaldron, or the kiln; but let the filling be done by
women

4. APPLICATION. It has already been observed, that lime is applied, indiscriminately, to every species of soil.

On the higher drier lands, its utility is evident.

At Malton, it is laid on a *calcareous soil*, with success.

In a comparative experiment, fairly and accurately made, on a *redstone soil* above Pickering, with three chaldron of lime an acre; the value of the lime, to the first crop, wheat, was not less than two quarters, an acre, and the succeeding crop of oats, (which now are upon the ground, Aug. 1787.) is a still stronger evidence of the great utility of lime, *in some cases*: in this case, the crop is at least *threefold*.

Nevertheless, it may be prudent in the occupiers of the *cold moist clays*, in the bottom of the Vale, to lime with caution.

Its use to the *loose sandy soils* of the West Marshes is, I believe, fully established; yet, in a comparative experiment on a *black moory soil, on clay*, its effect has thus far (the third crop) been *detrimental*, rather than useful.

It

women and boys; by which means industry will be encouraged, and the stones, by passing under the master's eye, will of course be rejected, if not sufficiently broken.

It is not my intention to damp the spirit of improvement, but to endeavour to direct it to suitable objects. Nothing, at present, but COMPARATIVE EXPERIMENTS can determine the value of a given lime, to a given soil; and no man can, with common prudence, lime any land, upon a large scale, until a moral certainty of improvement has been established, by experience.

The prevailing CROP is *wheat on fallow*. It is also pretty generally set on, for *rape*, *turneps*, or other crop, after *sodburning*, and spread among the ashes. It is also, not unfrequently, set on for *barley*. But its effect, to the *first crop*, except of wheat or rape, is, I believe, seldom perceptible.

But beneficial as lime undoubtedly is, in some cases, to CORN, its benefit to GRASS is a matter in dispute, even among the farmers of Yorkshire. Incidents are authenticated in which, to general appearance, it has been *detrimental*.

But without the assistance of *comparison*, the judgment is at a loss to ascertain, with any degree of precision, the effects of Manures. Nevertheless, general appearances, to those who have a knowledge of the nature of the soil, have their weight.

It seems, however, to be a generally received idea, that lime, which is laid on for grass, is not thrown away; for, whenever the land is again turned up, its benefit to corn will have full effect. See NAT. HERB.

5. LIMING. Long as lime has been in common use, as a manure, the proper method, of applying it to the soil, is far from being universally practised.

The *methods* of liming are various.

The worst is that of laying it in large heaps, and suffering it to run to jelly, before it be spread upon the land.

Next to this is setting it about the land, in *small hillocks*; for although these hillocks be spread, before they approach the state of mortar, this method is injudicious.

Lime, which falls in the open air, does not fall to powder, but breaks into checquers, or small cubical masses; which, being once buried in the soil, may remain in it, for ages, without being mixt intimately with it.

As far as experience and theory have yet reached, lime ought to be spread in a state of PERFECT POWDER, and be mingled, intimately with the soil; and thus, by assimilating the two ingredients, form with them one homogeneous, calcareous mass.

A single

A *single stone*, exposed to a moist atmosphere, falls into *fragments*, not into *powder* *. The smaller the heaps, the nearer they approach to single stones; there is a greater proportion of *surface*, and consequently a greater proportion of *fragments*.

It is therefore the practice, of judicious husbandmen, to set lime upon the land, in LOAD HEAPS, and spread it over the soil out of carts, *as soon as it is sufficiently fallen*.

There is an instance of practice, in this neighbourhood, and, I believe, only one, which is still superior to that last mentioned. In this instance, the load heaps are *turned over*, not so much to finish the falling, as to gain an opportunity of burying the granulous surface of the heaps; by which means the fragments are at least lessened, if not reduced to powder.

In the MORELANDS, a still better practice is said to prevail. There, the heaps are *inter-layered*, and *covered up*, with moist "*turf-mold*"

* It is observable, however, that much depends upon the nature of the stone, from which the lime has been burnt. Stones of a uniform texture, as most marbles, are less liable to fall in granules, than stones which are naturally composed of grains, or are divided by fissures into natural fragments.

mol'd" (the rubbish from peat and turf fuel!), which bringing on a rapid fall, the whole is set on fire, and the surface kept free from granules, by a covering of dry ashes.

This leads to a general IMPROVEMENT in the method of SLAKING LIME: Cover up the heaps, whether large or small, with soil, either of the field they are set in, or that of lanes or ditches, carted to them for the purpose; and, if a speedy fall be required, throw water over this covering. See Art. CEMENT, page 112.

6. TIME, &c. OF SPREADING. If lime be used on *fallow for wheat*, it is generally spread on, in *July*; good farmers making a point of *barrowing it in, as fast as it is spread*, and plowing it under, with a shallow furrow, as soon as convenient.

7. The usual QUANTITY set on is three to four chaldrons an acre.

IV. DUNG. Nothing sufficiently noticeable, respecting this species of manure, has occurred to me; excepting some incidents relating to the manuring of grass land, which will appear under the head NATURAL HERBAGE; and excepting a general deficiency in Farm-yard Economy, for which see FARM-YARD MANAGEMENT.

SEMINATION.

10.

SEMINATION.

THE SPIRIT OF IMPROVEMENT may have led some *gentlemen*, but, I believe, not one *yeoman*, or regular-bred *farmer*, to make experiments in the DRILL HUSBANDRY; at least, not of late years. In the day of Mr. Tull, some trials were made of it; but the results were not sufficiently favorable to establish it as a practice.

A singularity in the method of sowing BROADCAST is noticeable; though not peculiarly excellent. The common way is to go *twice over the ground*, sowing half the seed one way, and (returning on the same land) half the other; the seedsmen, in this case, filling his hand at one step, and making his cast at the next. But, in the method under notice, he casts *at every step*, and sows the whole of the seed, *at once going over*. This method is more expeditious, than the common way; but it requires a steady eye, and an expert hand, to seed the ground evenly.

WEEDS.

II.

WEEDS and VERMIN.

I. SPECIES OF WEEDS. There are, in this District, men who have been singularly observant, with respect to the nature of WEEDS; marking their CONTINUANCE, and describing their methods of propagation and *rooting*, with *more* than botanical accuracy.

What I principally propose, under the present head, is, to enumerate the SPECIES OF WEEDS most noxious to the ARABLE LAND of this neighbourhood, and to note what appears to be worthy of notice, respecting the different species.

It may be proper to say, that in arranging the species I have *endeavoured* to place them according to their DEGREES OF NOXIOUSNESS; whether it arise from their respective qualities, or from the quantity which prevails, *in the neighbourhood of Pickering*. The GRASSES and the *shrubs* are purposely kept separate, to
 shew,

shew, with greater perspicuity, their several degrees of hurtfulness, to the arable lands of the District under observation.

Provincial names. *Linnean names.* *English names.*

Common thistle.—*serratula* * *arvensis*,—
corn thistle.

Docken,—*rumex crispus*,—curled dock.

Nettle,—*urtica dioica*,—common nettle.

Swine thistle,—*sonchus oleraceus*,—common sow thistle.

Wild oat,—*avena fatua*,—wild oat.

Runsh,—*sinapis arvensis*,—wild mustard.

Runsh,—*raphanus raphanistrum*,—wild radish.

Runsh,—*brassica napus*,—wild rape.

Dea-nettle,—*galeopsis tetrahit*,—wild hemp.

Hairough,—*galium aparine*,—cleavers.

Groundsil,—*senecio vulgaris*,—groundsel.

Chicken-

* Let no voluminous writer lay claim to perfect accuracy. Linneus, whose system is a wonderful exertion of the human mind, with respect to accuracy of arrangement, appears to have made an evident mistake, in the classification of this common plant. How he could be induced to tear it from its *natural* family CARDUUS, and force it into that of *serratula*, may now be difficult to be ascertained. I retain the name,—but protest against the propriety of it. The LINNEAN NAMES are now gone forth, throughout all nations; and whoever changes them is speaking a language unknown to UNIVERSAL BOTANY.

<i>Provincial.</i>	<i>Linnean.</i>	<i>English.</i>
Chicken-weed,	<i>alsine media</i> ,	chickweed.
Dog-finkle,	<i>anthemis cotula</i> ,	maitheweed.
Dog-finkle,	<i>matricaria chamomilla</i> ?	corn camomile.
Cup-rose,	<i>papaver rhæas</i> ,	round smooth-headed poppy.
Cup-rose,	<i>papaver dubium</i> ,	long smooth-headed poppy.
Bur thistle,	<i>carduus lanceolatus</i> ,	spear-thistle.
Red thistle,	<i>carduus palustris</i> ,	marsh-thistle.
Swine thistle,	<i>sonchus arvensis</i> ,	corn sow-thistle.
Crowfoot,	<i>rannunculus repens</i> ,	creeping crowfoot.
Foal foot,	<i>tussilago farfara</i> ,	coltsfoot.
	<i>potentilla anserina</i> ,	silverweed.
Fat hen,	<i>chenopodium album</i> ,	common-goosefoot.
Fat hen,	<i>chenopodium viride</i> ,	redjointed goosefoot.
Popple,	<i>agrostemma githago</i> ,	cockle.
Stoney-hard,	<i>litbospermum arvense</i> ,	corn gromwell.
Corn bind,	<i>polygonum convolvulus</i> ,	climbing buckweed.

Provincial.

Linnean.

English.

Sour-docken,—*rumex acetosa*,—common
forrel.

Sour-docken,—*rumex acetosella*,—sheep's
forrel.

Great horseknoobs,—*centaurea scabiosa*,—
corn knobweed.

Great blue-caps,—*scabiosa arvensis*,—corn
scabious.

Cuifhia,—*heracleum sphondylium*,—cow-
parsnep.

chrysanthemum segetum,--corn marigold.

Yer-nuts,—*bunium bulbocastanum*,—earth
nuts, or pig nuts.

daucus carota,—wild carrot.

centaurea cyanus,—bluebonnet.

trifolium melilotus-officinalis,—melilot.

trifolium alpestre,—alpine trefoil.

Docken,—*rumex obtusifolius*,--broadleaved
dock.

Docken,—*rumex sanguineus*,—bloody dock.

carduus nutans,—nodding thistle.

carduus erispheus, ---- woollyheaded
thistle.

thlaspi campestre,—common mithridate.

lappula communis,—nipplewort.

polygala persicaria,—common persi-
caria.

poly-

<i>Provincial.</i>	<i>Linnean.</i>	<i>English.</i>
	<i>polygatum aviculare</i> ,	—hogweed.
	<i>mentha arvensis</i> ,	—corn mint.
	<i>chrysanthemum leucanthemum</i> ,	—oxeye
daisey.
	<i>ranunculus arvensis</i> ,	—corn crowfoot.
	<i>ranunculus acris</i> ,	—common crowfoot.
	<i>cucubalus behen</i> ,	—bladder campion.
Cornbind,	— <i>convolvulus arvensis</i> ,	— corn
convolvulus.
	<i>achillea millefolium</i> ,	—milfoil.
Saxifrage,	— <i>peucedanum silaus</i> ,	— meadow
fassafras.
	<i>lycopsis arvensis</i> ,	—corn buglos.
Bur-docken,	— <i>arctium lappa</i> ,	—burdock.
	<i>antirrhinum linaria</i> ,	— common snap-
dragon.
	<i>valeriana locusta</i> ,	—corn valerian.
	<i>reseda luteola</i> ,	—weld.
Breckens,	— <i>pteris aquilina</i> ,	—fern.
Crake-needle,	— <i>scandix pecten-Veneris</i> ,	—
shepherd's needle.
	<i>veronica hederifolia</i> ,	—ivy-leaved speed-
well.
	<i>cerastium vulgatum</i> ,	—common mouse-
ear.
	<i>fumaria officinalis</i> ,	—common fumitory.
	<i>euphorbia helioscopia</i> ,	—sun spurge.

ana-

Provincial. Linnean. English.

anagallis arvensis, — pimpernel.

filago germanica, — common cudweed.

euphrasia odontites, — red eyebright.

hypochaeris radicata, — longrooted hawk-
weed.

mysotis scorpioides, — scorpion mouse-
ear.

viola tricolor, — common pansie.

prunella vulgaris, — selfheal.

Quicks, — *tritium repens*, — couchgrass.

festuca duriuscula, — hard fescue.

White grass, — *holcus mollis*, — couchy soft
grass.

avena elatior, — tall oatgrass.

agrostis alba, — creeping bentgrass.

alopecurus agrestis, — field foxtail.

Droke, — *lolium temulentum*, — darnel.

dactylis glomerata, — orchardgrass.

White grass, — *holcus lanatus*, — meadow
softgrass.

Ash, — *fraxinus excelsior*, — ash.

Aspen, — *populus tremula*, — trembling po-
plar.

White thorn, — *cratægus oxyacantha*, —
hawthorn.

Black thorn, — *prunus spinosa*, — sloethorn.

*Provincial.**Linnean.**English.*

Briar,—*rubus fruticosus*,—common bramble.

rubus cæsius,—dwarf bramble.

Cat whin,—*rosa spinosissima*,—burnet rose.

Rustburn,—*ononis arvensis spinosa*,—thorny restharrow.

Rustburn,—*ononis repens*,—trailing restharrow.

II. THE MEANS OF EXTIRPATION. There are two ways of extirpating weeds from ARABLE LAND: by *fallowing*, and by *weeding*.

I. By the term FALLOWING, is meant repeated plowings, harrowings, &c. between the crops; whether these plowings, &c. be given in two, in twelve, or in eighteen months.

There are several species of weeds, which cannot be wholly overcome, without fallowing. Weeds, which propagate their species, by SUCKERS FROM THE ROOT, are invigorated, by a *single plowing*; which, by giving a fresh supply of air and openness to the soil, gives freedom to the suckers; and, by destroying the seed weeds in the operation, the suckers are left in possession of the soil: and whoever attempts to overcome root weeds with

with the *hoe*, may be said to be unacquainted with the practice of husbandry.

The CONTINUANCE of a fallow, and the number of plowings requisite, depend on the season, and on the number and the nature of the weeds, to be destroyed. If the spring season be found insufficient to effectuate the purgation,—take the summer, and even the autumn, the winter, and the ensuing spring, *rather than crop an under-worked fallow*, which is but little superior to a single plowing. One stirring, towards the close, is frequently more valuable, than two or three plowings at the outset. To begin a fallow, without continuing it, *until its intention be fully accomplished*, is throwing away labor, unprofitably.

2. By WEEDING, is meant the act of destroying or checking weeds, while the crop is growing, to prevent their preying upon the soil, and propagating their species by seeding; whether the operation be performed with the *hoe*, the *spade*, the *hook*, or the *hand* alone.

Next to the plow and harrow, the HOE is the most destructive to *seed weeds*; but the hoe ought not, in any case, to be relied on: the HAND, alone, ought to give the *finish* to

weeding : and the *later* this is given, so that the crop be not materially injured by the operation, the more valuable will be its effect.

The *close* of this operation is similar to that of the fallow. One *additional* weeding is given at a small expence ; and without it, perhaps, those which preceded were of little benefit. One weed left to spread its seeds, this year, may be the cause of a hundred, the next.

III. VERMIN. The different species of vermin, which have more particularly excited notice, in this District, are,

1. Mice.
2. Rats.
3. Dogs.

I. MICE. The mouse rivals the sparrow, in mischievousness toward the farmer. In the field, the barn, and the dairy, mice are equally troublesome and destructive. In the field, the quantity of destruction is not easily to be ascertained ; but it is probably much greater, than the unobservant are aware of. At seed time, and at harvest, they not only feed freely upon corn, but fill their granaries with it, as a resource in less plentiful seasons*.

Much

* See MID. ECON. MINUTE 26. for a remarkable instance of this.

Much care is bestowed on the destruction of moles ; and it might be worth while to endeavour to lessen the number of field mice, which, I am of opinion, are in their nature more injurious to the farmer than moles are.

In the rick yard, the barn, the dwelling house, the garden, and the nursery ground, their mischievousness is too obvious to be overlooked, and the utility of lessening their number, in these places, is too well known to require an enumeration of facts to prove it.

The method of destroying mice is a subject, not unworthy of the attention of any man, who is interested in rural affairs. If some art, or some natural enemies, were not employed, in lessening their number, the entire supply of human food would not be sufficient to support them. Even in their present state, I have heard it intimated, by a man whose observations are frequently just, that it is a disputable point, whether the mouse or the tithe man is a greater enemy to the farmer *.

Z 3

The

* This idea, however, is more applicable, in a grass land country, where corn, being less in quantity, is more liable to be destroyed by mice, than it is, in an arable country, where

The barn and the stackyard are usually put under the care of the cat : to set a mousetrap, in a barn full of corn, has generally been considered as a thing so unlikely to be effective, that it has seldom perhaps been tried : I have never met with an instance of it ; excepting one in this District ; in which its success has been extraordinary. A barn, which for many years had been remarkably infested with mice (notwithstanding a numerous guard of cats), has, by a proper use of traps, been kept in a manner free from them.

It having been observed, during long experience, that these mischievous animals, uncontented with their destruction among the corn, — attacked leather, grease, or other animal food, which happened to be left in the barn, — traps were set in their runs, and hiding places, and baited with these substances. The success was every thing to be desired ; for although a total extirpation has not taken place, an annual saving of some quarters of corn has been the consequence.

Under

where the proportion of corn is greater ; — where the barn is oftener emptied, — and where pillar stack-frames, and pillar granaries, are generally more in use.

Under an idea, that it was a CHANGE OF FOOD which, in the barn, constituted the *bait*, the same principle was applied, in the cheese chamber, and with the same success. Here, traps, baited with corn, were taken with avidity.

In the garden, it was observed, that much depended on the season of the year : therefore, here, natural hiding places were sought for ; and if convenient ones could not be found, artificial ones were made, in different parts of the garden ; with logs, stones set up hollow, on-edge, boards, &c. In these hiding places, a variety of foods are laid, for several days, whenever mice become troublesome ; and whatever food is preferred, with that traps are baited.

By these means, the entire premises have been kept almost wholly free from mice.

While the number is great, various kinds of traps may be used, provided they be properly baited : for taking a remaining artful few, the common steel trap, adapted to the size of the mouse, has been found to be the most effectual.

2. RATS. This animal, equally artful and mischievous, is difficult to be taken by stra-

tagem : in farm homesteads, situated near water, it is become almost impossible to keep down their numbers. In every country, they are a growing evil ; not only in Rural Economy, but in manufacture, and in domestic life. Should their numbers continue to increase, with the same rapidity they have done since the present breed got footing in the island, they will, in no great length of time, become a serious calamity. They are, perhaps at present, an object of public attention.

3. DOGS. It is not through an antipathy to dogs, that I class them here among vermin. I am led to it, by facts, which, though not extraordinary, ought to be generally known.

A few years ago, the whole country was alarmed, with the apprehension of CANINE MADNESS. A considerable proportion of the dogs, kept in it, were actually mad. Much live stock, and several persons, were bitten. Fortunately, however, thus far, none of *these* have been attacked, by that horrid disorder ; but they still live under the dreadful apprehension of their being, every day, liable to be seized,

seized, by the greatest calamity human nature is liable to *.

In the course of last winter (1786-7) the value of SHEEP WORRIED BY DOGS, in this township alone, was calculated at near one hundred pounds. A small farmer, whose entire stock did not amount to more than forty, had thirteen sheep, and eleven lambs, worried in one night.

These

* Since writing the above, no less than seven persons were, in this place, bitten by one dog! Much live stock has also lately been bitten. In a neighbouring village a calf, which had been bitten, was seized with madness, and bit the person who had the care of it.

What aggravates the first-mentioned instance is, that the person, to whom the dog belonged, knew that he had been bitten, a few weeks before, yet suffered him to go loose, though urged to the contrary. Surely, on culprits like this, some severe penalty, or some severe punishment, ought to be inflictible. A general law against every man, whose dog is suffered to *stray*, in a state of madness, might have a good effect.

If the practice of *worming* be really effectual, in preventing the mischiefs of canine madness, a severe penalty is due from every owner of a dog, which has not undergone so salutary an operation.

Several instances are related of persons, to whom canine madness has proved fatal, in this neighbourhood. And the instances of live stock, which have suffered by the same means, are innumerable,

These are not mentioned as singular facts : every District, and almost every year, afford instances of a similar nature ; nor do I mention them to excite a momentary indignation, in the breast of the reader ; but in hopes that they may be instrumental, in rousing the humanity, of those, who have it in their power, to mitigate the danger, and lessen the quantity of evil.

The quantity of human food, which is annually wasted on *useless* dogs, is itself an object of national attention. When the horrors of canine madness, the wanton torture of innocence, and the wanton destruction of one of the first necessities of life are added, the object becomes of the first concern to the nation. Who, even in these days of Public Economy, would think ten thousand pounds a year ill bestowed, in doing away such an accumulation of public evil ? Yet who does not know that, in doing it away, ten times ten thousand a year might be drawn into the national treasury ! Let not the patriotism of Princes, the ability of Ministers, or the wisdom of Parliament, be spoken of, in this country, until a NATIONAL ABSURDITY, so glaringly obvious, be removed.

There

There are men whom *friendship* inclines to the cause of the dog. Far be it from me to damp the flame of friendship. But is not the lamb equally, at least, entitled to our friendship? Who sees the little innocent dragged to the slaughter without regret; and who, without remorse, could see one lying mangled in the field, half alive, half eaten up, by the merciless, yet *befriended* dog?

But the operation of a tax upon dogs would, probably, be different to what is generally conceived. I am of opinion, that, were such a tax to be laid on judiciously, the immediate destruction of dogs would be inconsiderable. The tie of affection must be weak which a shilling, a year, would dissolve: even the poor man's dog would die a natural death, under those easy circumstances.—But what poor man would think of paying, even a shilling a year, for a dirty troublesome puppy, for which he had not yet conceived any particular affection? Thus the number of dogs would, annually, and imperceptibly, decrease.

In six or seven years, the tax would require an advance: its productiveness would be lessened, and the rearing of another class of
dogs

dogs would require *prevention*. In a few years more, it might receive its final advance.

The productiveness of the tax ought not to be considered, as the primary object of a tax upon dogs. The removal of the public evils, which have been enumerated, should be at least jointly considered. Five shillings a head would reduce the number of dogs; and would, perhaps, be found, on experience, to be more productive than a lower tax.

I 2.

H A R V E S T I N G.

NO DEPARTMENT of Rural Economy distinguishes the NORTHERN, from the MIDLAND, and SOUTHERN parts of the Island, so much, as the method of Harvesting. And, perhaps, no Northern District is more strongly marked, with this distinguishing characteristic, than that which is now under survey.

1. Cutting corn with the sickle.
2. Cutting corn with the sithe.

I. THE

I. THE SICKLE. It is probable that nine tenths of the corn, which is cut with the sickle, in *this* kingdom, is cut by *men*. In Surrey and Kent, a woman may sometimes be seen with a sickle in her hand. In Norfolk, it is a sight which is seldom or ever seen. Here, it is almost equally rare to see a sickle in the hand of a man ; reaping—provincially, “ shearing,”—being almost entirely done by WOMEN.

Three women and one man make a sett ; who, of a middling crop, do an acre, a day. If corn be thin, a man will bind after four women ; if very thick upon the ground, he requires a boy to make bands for him.

Sometimes, the bands are laid for the women to throw their handfuls into ; but, in general, they lay the corn in “ reaps,” of about half a sheaf each ; the binder gathering it up carefully, against his legs, in the manner wheat straw is usually gathered on the thrashing floor. This is much the best way (though somewhat more troublesome) ; the corn being, by this means, bound up tight and even, and the sheaves made of an equal size.

The day wages of a woman, in harvest, is 10d. of a man 2s. Thus wheat, which in
Surrey

Surrey would cost 10s. to 12s. and which, in any country I have observed in, would cost 7s. or 8s. is here cut for 4s. 6d. an acre.

But the saving of so much, an acre, is far from being the only advantage, arising from the practice of employing women in the work of harvest. The number of hands is increased; the poor man's income is raised; the parish rates are in consequence lessened; and the community at large are benefited, by an increase of industry, and an acquisition of health. How conducive to *this* are the employments of husbandry, compared with those of manufacture! And the work of Harvest, so far from being thought a hardship, is, by women who have been bred to it, considered as a relaxation to domestic confinement, and less agreeable employments.

WHEAT and RYE are set up in shucks,—provincially “stooks,”—of twelve or ten sheaves each; two of which are invariably used as “hood-sheaves”; for hooding, capping, or covering the heads of the rest. Twelve sheaves are termed a “stook;” in which wheat, formerly, was generally set up; but unless the straw be long, two sheaves are not equal to the safe covering of ten. It is therefore, now, the more general practice, to
 set

set them up in “tens ;” by which means they are much more effectually covered.

In the south of England, the covering of wheat is never practised ; here, wheat is never left, a day, uncovered. Both practices are wrong. In fine weather, the ears of corn cannot be too much exposed to the sun and dews ; if the grain be thin, even a slight shower is of great benefit to it. In a rainy season, they cannot be covered too closely. Therefore, in the covering of wheat, as in other departments of husbandry, the farmer ought to be directed by the season ; not by any bigot custom of the country he happens to farm in.

II. SITHE. In the southern and midland provinces, corn is invariably *mown outward*, and dried in *swath*. Here, it is as invariably *mown against the standing corn*, and dried in *sheaf*.

The method of sheafing varies. Upon the Wolds, the prevailing method is to bind the sheaves, in the usual banding place, and to set them up, in “stooks.” This is termed “binding ;”—a practice which appears to be encreasing in the Vale.

But formerly, the invariable practice was, and the prevailing practice still is, here, to tie
them

them near the top, and set them up in *single sheaves*, — provincially, “gaits.” This is called “gaiting ;” which, if the corn be weedy, or full of cultivated grass at the bottom, is a most admirable practice.

1. In mowing corn for sheafing, a cradle of three points (similar to that of two points used in Kent, and in mowing corn into swath) is generally placed over the *sithe*, to collect the corn, and assist in setting it up straight, but somewhat leaning, against the standing corn. If corn stand fair, a man who knows how to set his cradle, and use his *sithe*, will set it up with great evenness and regularity. If corn be somewhat disordered, yet mowable, a bow (similar to that used in most countries for mowing corn outward) is affixt to the *sithe*, for the same purpose.

The mower is followed by a woman, who makes bands, and “lays out” the corn into sheaf. This she does, either with the hands alone, or with a short-headed, long-toothed wooden rake : gathering the corn with the rake ; and, when a sheaf is collected, throwing it dextrously into the band, with her foot ; without touching it with her hands ; and, consequently, without the inconveniency of stooping.

stooping. If the crop be large, the woman has generally a boy to make bands for her.

A man, or a stout boy, follows to tie and set up the sheaves; or, if the crop be thin, one man binds after two fithes.

2. SETTING UP SINGLETS. To do this properly, and expeditiously, there is an art and dexterity requisite, which can only be learnt from practice. The band being loosely tied, at about the same distance from the head of the sheaf, as it usually is from the butts,—the binder lays hold of the ears, with both hands, immediately above the band, and strikes the sheaf down pretty hard upon its butts; in order to give it a flat even base. One hand (the right for instance) is then loosened, and inserted edge-way into the middle of the butts. The body, with the arms in that posture, is thrown forward, and brought round with a sweep to the right; thereby spreading the butts of the right-hand side of the sheaf. The situation of the hands is then changed: the right is placed upon the ears, the left within the sheaf, bringing them round with a sweep to the left, leaving the sheaf a *hollow cone*.

If the face, in this operation, be turned toward the north, and, in the last sweep, an

opening or breach be left toward the south, the rays of the sun will have admission, to keep the ground dry within, and assist the wind in drying the inner side of the sheaf.

These particulars may, on paper, appear tedious ; but, in practice, an expert hand will go through them in a few seconds of time.

There is, however, a much readier way of setting up single sheaves ; namely, by lifting them as high as the arms will conveniently reach ; and bringing them smartly to the ground, with a jerking motion. This spreads the butts ; but does not give the desirable *hollowness* ; nor the *firmness*, which is requisite in windy weather.

When the singlets are dry enough, for carrying, they are “bound,” in the usual banding place.

3. In BINDING SINGLETS, the band is laid upon the ground, about a foot from the skirts of the singlet ; which is pulled over upon it, and bound in the common manner. The original band of the first sheaf is pulled off for the second ; so that, without an accident, the first band, only, is required to be made, at the time of binding. This renders the operation less tedious than theory may suggest.

The

The sheaves, when bound, are collected into heaps, and carried on the day of binding; or are set up in shucks, as accidents or convenience may require *.

4. If the corn be "BOUND," AT THE TIME OF MOWING, it is set up in SHUCKS; in which it stands until it be fit for carrying.

This is less troublesome, than first "gaiting" and afterwards "binding" it. And if the corn be ripe, and the bottom be tolerably free from weeds, it is, perhaps, the more eligible method, for corn which is cut with the SITHE.

But, for under-ripe, or weedy corn, though cut with the sithe; and for all *oats* and *barley* which are cut with the SICKLE; "gaiting" is here considered, as essentially necessary. Corn

A a 2

cut

* GAITING. This practice is probably of Scottish extraction. In the dialect of the English language, now used in the Highlands of Scotland, where this practice is much in use, "GAIT" is the ordinary name, (or the established pronunciation,) of the GOAT. In the dialect of the Celtic language, likewise in use there, single sheaves set up, as in this practice, are called GOURACS;—from *gour*, a goat,—*gourac*, a little goat;—the diminutive of *gour*.

Hence, there seems to be little doubt of the name having been taken from the animal. But whether the Saxon Scots borrowed the practice, and the name, from the Celts, or the Celtic Scots from the Saxons, may, now, be difficult to trace.

cut with the sickle lies straighter, and closer, in the band, than mown corn ; which, being more or less ruffled, with the sithe or the rake, does not bed so closely in the band ; the air thereby gaining a more free admission, into the center of the sheaf.

If *barley* be short upon the ground, free from weeds, and well headed (especially the four-rowed barley or “big”), it is difficult to be “gaited ;” the heads of the sheaves being too bulky, and the butts not sufficiently so, to form a basis broad enough to support them. Its slippery nature, also, renders it difficult to be kept in a loosely tied band. Barley, therefore, is more commonly bound after the sithe, than oats are. But when it runs much to straw, and is weedy, or full of grasses at the bottom, gaiting becomes essentially necessary to accurate management. Barley is more liable, than any other grain, to take damage in the field ; and every means of forwarding its drying, thereby shortening the length of time between the cutting and the carrying, ought to be employed.

Shucks of oats and barley, bound after the sithe, are generally left uncovered, until the time of carrying. If, however, the season be unsettled, and the heads be pretty well weathered,

weathered, while the butts are yet under dry, it is well to put on hood sheaves, and thereby guard the grain from too great an exposure to the weather.

GENERAL OBSERVATIONS ON HARVEST- ING BARLEY and OATS.

The COMPARATIVE ADVANTAGES of harvesting barley and oats, in sheaf, are numerous. The waste, throughout, is less; the corn, especially in gaits, is, at once, got out of the way of the weather; the labor of carrying, houseing, or stacking, is much lessened; much barn room is saved; the labor of thrashing is less; the straw, if the harvest prove wet, makes much better fodder; and, under this circumstance, the corn preserves its color, in sheaf, incomparably better, than it does in swath.

The *apparent inconveniency* of Harvesting corn in sheaf (I mean that which must strike every one who has not duly considered the subject, and compared the nature and the quantity of labor, separately, requisite to each of the two methods of Harvesting) is the increase of labor, at the outset. But if the laying out, and the binding, be done by

women and boys, or by men who cannot mow (which is almost invariably the case) the business of mowing goes on the same pace, or nearly the same pace, as it would have done, had the corn been mown into swaths. Besides, the repeated turnings, which frequently are requisite, and the cocking, which always is necessary, are entirely excluded, by binding.

Upon the whole, it is evident, that the quantity of *men's* labor is diminished, not increased, by the practice of Harvesting in sheaf. If, to this advantage be added, the ease and expedition, in the business of carrying (the most important business of harvest, and that which requires the quickest dispatch), we may fairly conclude, that, by Harvesting in sheaf, the labor, the anxiety, and the hazard of harvest are lessened; while the quality, and consequently the value, of the produce is increased.

My own practice having been in Districts, where Harvesting, in swath, is the universal custom, I had conceived, that the practice of Harvesting, in sheaf, was only adapted to a *country thin of corn*; and that it was altogether impracticable, in what is called a CORN COUNTRY. But the wolds of this District
leave

leave no room for such a conjecture. The Yorkshire Wolds are not only a corn country, but the farms are many of them of extraordinary size: nevertheless, it is the invariable practice of that District to harvest barley and oats, in sheaf. One man, a few years ago, grew between three and four thousand quarters of oats and barley,—every bushel of which was harvested in sheaf.

I am too well aware of the difficulty of changing the custom of a country, to recommend to any man, who farms in a southern District, to attempt to harvest all his corn, in sheaf, without regard to the weather, or the state of the season. But I will not hesitate to recommend, to every man, who has barley or oats to cut, in a wet season, or in a late harvest, to harvest them in sheaf.

In Surrey, and other counties, where mown corn is laid straight in swath, there would be no difficulty in harvesting it, in sheaf. The corn might be mown outward, in the usual manner, and sheaved out of swath; which is, perhaps, upon the whole, a better method of sheafing, than that which has been described, as the practice of this District.

The great art of laying corn straight with the sickle, whether it be mown inward or

outward, is to keep the face somewhat inclined toward the standing corn : thus, in mowing outward, the left hand and the left foot ought to go somewhat foremost : on the contrary, in mowing inward, the right side ought to precede. Much depends upon setting the cradle, or the bow ; which should be so set, as to take the whole of the corn, cut at each stroke, without interfering with the standing corn. The sithe, in mowing, ought to be brought well round to the left, as if for the intention of throwing the corn behind the mower. To allow for this length of sweep, the swath should not be taken too wide ; nor, in ravelled corn, should the sithe be too long.

By a little practice, *young* men, who can handle their sithes, and whose dispositions incline them to oblige, might, in any country, soon be rendered sufficiently perfect, in the art of laying corn straight, in swath ; or of setting it up straight, and evenly, against the standing corn. In exercising these, young women might, at the same time, be taught to lay out the corn into sheaves, and stout lads to set them up singly. A leisure opportunity should be embraced. The outset should be considered as a matter of amusement. A
few

few acres, this year, might be an inducement to extend the practice to a greater number, the next. The art once acquired, it would be ready to be applied, on a large scale, whenever a wet season, or a backward harvest, should happen.

13.

FARMYARD MANAGEMENT.

I. BARN MANAGEMENT. The subdivisions of this subject, which are noticeable here, are,

1. Binding the straw.

2. Winnowing the corn.

I. BINDING STRAW. Straw, of every kind, is bound upon the thrashing floor. This, when straw is not used at the time of thrashing, would, in any country, be good economy. Straw in trusses is much better to move, lies in less room, and retains its flavor longer, than loose straw does. In a country where cattle, in winter, are universally kept in the house, and foddered at stated mealtimes, the binding of straw becomes

comes essential to good management. Each truss—provincially, “fold”—contains an armful (that is, as much as the arms can conveniently *fold*) ; and this is the usual meal for a pair of cattle. Thus the business of “foddering” is facilitated, and a waste of straw avoided.

2. WINNOWING. Under the article IMPLEMENTS, the present practice of winnowing, with the “machine-fan,” was mentioned. All that remains to be done, here, is to endeavour to give some general rule, for the method of using it.

Practice, only, can teach the minutiae of the art, which, though here so prevalent, is far from being well understood. The complexness of the machine is such, that laborers, in general, are ignorant of the means of adjusting it ; and let its construction be ever so perfect, much depends on regulating it, properly, for different kinds of grain ; as well as in setting it, with truth, for any particular species.

The outlines of the art lie, in adapting the strength of the wind, to a due and regular supply of the given contents of the hopper ; and in adjusting the several regulators, in such manner, as to separate the chaff, the capes,
and

and the grain, with the greatest possible exactness.

Wheat is generally run twice through the machine or mill ; but, with a good machine, properly regulated, and deliberately fed, it may be made marketable, by running it once through. *Barley* and *oats* are seldom put through, more than once. And *beans* or *peas* may be cleaned, as fast as a man can supply the hopper with them.

Superior advantages, of this species of fan, are dispatch, the saving of the labor of one man, and the preservation of the health of those who are employed. The sail fan,—the common winnowing fan of the kingdom at large,—requires one person to turn, one to riddle or “heave,” and one to fill the riddle or scuttles ; and, for this sett, seven or eight quarters of wheat is a hard day’s work. Two persons, with a machine fan, properly set, and properly supplied, will winnow the same quantity, in half a day. The fan, itself, supplies the place of the person who riddles ; and all the labor, which is necessarily bestowed, on the difficult work of separating the one continuous heap, into corn, chaff, and “capes,” and running the intermingled parts down, again and again, to reduce them

to

to one or other of those articles, is entirely saved.

II. YARD MANAGEMENT requires to be subdivided, in this case, into

1. Expenditure of straw.
2. Raising yard manure.

1. EXPENDITURE OF STRAW. In the Vale, and the Morelands, cattle are, almost universally, kept tied up in houses or hovels, or under sheds, which, if the aspect be good and the ends properly sheltered, are preferable to close houses. Warmth and dryness are doubtless of great advantage to cattle, in winter; especially to lean straw-fed cattle; which cannot bear the severity of weather, so well as cattle whose keep is higher. But, in this, as in most things, there is a *medium* to be observed. The hair of cattle, kept in a close warm house, naturally grows thin, and peels off, prematurely; exposing the cattle, when turned out to grass in the spring, to a degree of unnecessary hardship, which, in its effect, is perhaps frequently worse, than exposing them in an open yard, in the winter months.

The warmth of the cattle, however, appears to be, here, only a secondary object: the SAVING OF FODDER seems to be the principal motive, for tying up cattle of every
kind,

kind, in winter ; by which means, almost every straw is eaten ; the cattle frequently lying without litter, upon the bare floors of their stalls. Twenty or thirty head of cattle are kept, here, on the same quantity of straw, which, in most corn countries, is allowed to be picked over, by eight or ten.

The dung drops into a square trench, which is cleaned every day, while the cattle are out at water, or in the fields at grafs.

Stalled cattle are usually foddered, four times a day : in the morning ; again in the forenoon ; a third time when they are taken up from watering ; and, finally, in the evening. The best of the straw is given to the young stock, the inferior sort to oxen. Cows are chiefly kept on hay, even when they are dry of milk : an evident impropriety ; especially when applied to the short-horned breed of cows, which generally calve with difficulty.

On a general view, it is evident, that the expenditure of straw, in this country, is adapted to its climature, and to its state of husbandry. Where grafs land abounds, cattle of course are numerous, and straw proportionally scarce. On the contrary, in a corn-land country, straw is more plentiful than stock ;

stock ; and all that is thought of, there, is to get it *trodden* into manure.

2. RAISING YARD MANURE. It would be foreign, to the *present* work, to canvass the propriety of *treading* straw into manure. This country has generally stock enough to *eat* every straw it produces ; therefore to *tread* it to manure, and to *waste* it, are, here, synonymous expressions. It is all wanted as fodder, and it would be an evident absurdity to litter the yard with it. All I propose, at present, on this subject, is, to recommend to my countrymen a more provident management of the little yard manure they make,—let its quality be what it may.

The general practice, at present, is to pile it on the highest part of the yard ; or, which is still less judicious, to let it lie scattered about, on the side of a slope ; as it were for the purpose of dissipating its virtues.

The urine, which does not mix with the dung, is almost invariably led off, the nearest way, to the common shore ; as if it were thought a nuisance to the premises. That which mixes with the dung is, of course, carried to the “midden,” and assists in the general dissipation.

A yard

A yard of *dung*, nine tenths of which is straw, will discharge even in dry weather, some of its more fluid particles ; and, in rainy weather, is, notwithstanding the straw, liable to be washed away, if exposed on a rising ground.

But how much more liable to waste is a mixture of dung and urine, with barely a sufficiency of straw to keep it together, in a body ? In dry weather, the natural oozing is considerable ; and, in a wet season, every shower of rain washes it away, in quantity. It may be a moot point whether, in some cases, half the essential virtues of the dung, as a manure, may not be lost by improper management. Certain it is, that, in all cases, much too great a proportion is lost ; and it behoves the husbandmen of this District, and of every District where the housing of cattle in winter is practised, to pay particular attention to the management of Farmyard manure.

If a small proportion of the expence and attention, which has of late years been so well bestowed on the making of DRINKING POOLS, were to be applied to the forming of DUNG YARDS, the profits, great as they are
in

in one case, would, I am persuaded, be found still greater in the other.

The Norfolk method of BOTTOMING the dung yard, with mold, is here indispensably necessary, to common good management. There is no better manure, for GRASS LAND, than mold saturated with the oozings of a dunghill: it gets down quicker among the grafs, and has generally a more visible effect, than the dung itself. To neglect so valuable a source of manure, is neglecting a mine of gold and silver, which may be worked at will. Under this management, the arable land would have the self-same dung, it now has; while the grafs land would have an annual supply of riches, which now run waste in the “strands” and rivulets.

But, before a dung yard can, with propriety, be bottomed with mold, the bottom of the yard, itself, ought to be properly FORMED. A part of it, situated conveniently for carriages to come at, and low enough to receive the entire drainage of the stable, cattle stalls, and hog sties, should be hollowed out, in the manner of an artificial Drinking pool, with a rim somewhat rising, and with covered drains laid into it, from the various sources of liquid manure.

During

During the summer months, at leisure times, and embracing opportunities of back-carriage, cover the bottom of the basin, a foot or more thick, with mold,—such as the scowerings of ditches, the shovelings of roads, the maiden earth of lanes and waste corners, the coping of stone quarries, or the soil of fallow ground,—leaving the surface dishing; and, within the dish, set the dung pile: equally preventing the admission of extraneous water into the reservoir, and the escape of that which falls within its area.

14.

MARKETS and PAPER MONEY.

MARKETS. CATTLE and SHEEP are mostly sold in the MARKET TOWNS of the Vale. WHITBY and SCARBOROUGH take the surplus of such as are fit for the butcher; and those which are lean, are bought up by the SOUTH-COUNTRY PROVERS. MALTON is the principal market for *horses, corn, butter,*

and *bacon*. *Oats*, ordinary butter, and *bacon*, find a market in the manufacturing District of WEST YORKSHIRE: prime butter, and some *bacon*, travel, by way of Hull, to the METROPOLIS. Horses are divided between the LONDON and FOREIGN MARKETS.

PAPER MONEY. An evil, which has been long growing in the markets of this kingdom, has here got to a height that entitles it to notice.

GOLD can no longer be considered as the medium of property. Let a man sell his whole stock, at market, and it were mere chance, if he brought home with him more than a few guineas. The bulk of the value received is invariably PAPER:—not bank notes,—but paper of no other value, than that which is given it by the engraver, and the name, perhaps, of some shopkeeper, or other petty banker, wholly unknown to the farmer; who, probably, is entirely ignorant, as to whether the name, or names, be real or fictitious.

One *accident* has already happened, in this neighbourhood; and it is matter of astonishment, that more do not follow: a circumstance, which can only be accounted for, by
the

the *profits*, which this species of coinage affords*.

An arch cobbler of Newcastle upon Tyne has made a fortune, by coining penny and twopenny notes †, which are highly embellished, and rendered valuable, by a long list of respectable names; his friend *Cristin* at the head of them. They are also payable in London, at a *house of names*, equally respectable and responsible: the finest burlesque upon modern banking, which can possibly be conceived. The fellow is said to have pocketed, already, a thousand pounds by the thought.

The *conveniency* of paper money few men will deny; especially, now, when the weighing of gold is become, in some degree, necessary: a business which is extremely awkward, in a market. All the *farmer* wants is *security*.

On the other hand, the *profitableness* of paper money, to those who coin it, is still

B b 2

less

* Not only by the interest of the amount of bills in circulation; but by *dead notes*; that is, bills lost and destroyed by accident; the amount of which is clear gain.

† Circulated among the colliers, keelmen, and sailors; every one being proud to have a "bank note" in his pocket.

less disputable. But why shall *individuals* be suffered to batten on the public, by the profits of COINAGE? Why shall one man be dragged to the gallows, for coining a few shillings, while others are suffered to amass fortunes, by coining five and ten pound pieces? *If paper money be political*, the NATION, not *individuals*, ought to have the profits arising from it.

But the integrity of paper money, and the crime of coining it, form only part of the evil, which is here meant to be held up to view. I pretend not to the profound in political arithmetic; but I have always understood, that the prices of commodities, at market, bear a proportion to the quantity of money, in circulation. If this be in truth the case, the evil, here spoken of, has the most pernicious tendency.

In the *present state of Europe*, this country can preserve its *pre-eminence*, as a nation, by manufactures and commerce, alone. The demand for the manufactures of a given country will ever bear a proportion to their *comparative* price. The price of manufactures depends upon those of materials and labor; and *this* on the PRICE OF LIVING. If by a flow of cash in circulation (no matter whether

ther of gold, silver, copper, or paper) the prices of living, labor, and materials be suffered to advance, the demand for manufactures will of course decline, and with it the prosperity of the nation.

I wish not to intermeddle, officiously, in concerns of Government; but the subject, under notice, seems to be sufficiently connected with RURAL ECONOMICS, to warrant its being mentioned, in this place.

1796. These PRIVATE COINAGES, since they were here first held up to public notice, have engaged the attention of Government. To suppress or check them? No. To give them countenance, and literally to stamp their baleful effusions with public avowal,

END OF THE FIRST VOLUME.

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